

Agustin's Linux manual

By Agustin Velasco

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Agustín's Linux Manual

Installation & Internet



Volume 1

ISBN: 0-9752804-0-6

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Published by:
Vegaslocal.com

About the author

Agustin Velasco has over 15 years of experience in electronics and computer systems. Throughout the years he has earned a career in the technology arena, specializing in computer security and Data recovery.

By the end of 1995, he had an opportunity, and worked for a subdivision of Acer America, where he spent four years developing his skills in computer technology. Thereafter he was self employed, deploying networks and applying security at large scale. As a security specialist, he saw the need and mastered a technique in data manipulation which now he can use to recover lost or erased data from a variety of platforms.

As Linux became popular on the market, he started to experiment with it, and found that Linux is a highly reliable operating system. He started working with various Linux distributions including Slackware and Debian. Realizing that the end user might have problems working with some distributions, he started working with other more friendly packages. Soon after, he developed a technique based upon the Mandrake distribution.

Agustin is currently holding a position as technical director at www.netcontrol.org and is author of the second edition of these series based on Mandrake 10 Community Edition.

The purpose of this book and why it was written

This book has been written to help all of those who are interested in learning, are open minded and loves freedom. The book is written especially to assist educational institutions to teach people who have zero knowledge of Linux and perhaps for those who can not afford the pricy schooling but want to become a well respected system administrator.

The book takes one step by step from installation to system administration. It teaches how to set up Apache web server, Bind DNS server, Postfix email servers, Samba server and of course security. It gives you details on how to close unnecessary ports. It covers configuration on the Squid proxy server and demonstrates many of the available utilities that will assist you in system administration

Dedication

For my wife Amelia and my two kids Caroline and Kevin. I am really happy for having such a wonderful family, my wife for understanding and supporting me with all of my crazy ideas and my kids for not bothering me when I am writing or working on projects at home.

And last but not least to all of those who struggle in life to have an education, but never give up to demonstrate their abilities of accomplishing something. I myself have witnessed people without a degree who have accomplished the most wonderful skills but because a lack of a degree they have been put out of the practical field. "People don't give up nothing in life has been easy"

Acknowledgement

I'd like to thank my friend Anthony Whitaker (who lives in the shadows and wishes to remain anonymous); an idea man who undoubtedly could make any company number one and has been so helpful in the process of this book. Without his support this book wouldn't be completed. Anthony has a wide experience in the field of computers which made him a perfect person to review this book as an end user.

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Chapter 1

Installation

Getting ready for the installation

First of all, before we start the installation you must know the minimum requirements to run Linux. I want to make sure that your installation won't stop in the middle because of lack of space or because of hardware incompatibility.

I suggest you use a Pentium 400 MHZ+, because we are planning to use a desktop with graphical interface. The graphical interface is called Xwindow. The Xwindow allows you to browse your system by using your pointing device (mouse).

For a practice installation, a Pentium II or III with 64 MB RAM and 4.0 GB of hard drive space will do. Pentium MMX, Pentium 4 and AMD Athlon will do even better. If your computer is new, some of its peripherals may not work.

Most hardware works well with Linux. Make sure that your hardware is Linux compatible. Browse the web in search of information about your hardware.

If you are planning to use a modem, make sure your modem is a real modem (hardware modem) read on the retail box, it should say, "Works with Linux". Be careful not to buy a software modem (win modem); it will not work with Linux. It only works with Windows.

My personal Minimum requirements:

<ul style="list-style-type: none">• Pentium II 400 MHZ• 128 MB RAM• 8.0 GB Hard Drive• 16 MB /32 MB Video Card or more• 24x CD-ROM• Sound Card• Net card• Keyboard• Mouse• SVGA/UVGA Color Monitor	<p>Before We start the installation you must know about your hardware. Such as brand names and specifications, especially video cards and monitors.</p> <p>I suggest you use Nvidia for a video card (if new). For net card use Net gear, 3com or Intel.</p> <p>If your hardware doesn't work, check here to find out if it is supported: http://www.linux-mandrake.com/en/fhard.php3 Or check the manufacturer's website.</p> <p>Note: <i>if it is a built in video card you may on a rare occasion encounter problems.</i></p>
---	--

The minimum video memory requirement is 4 MB, if that's all what you have that is fine.

Table 1

Choosing a Linux Distribution

Once you have your hardware, you need a Linux distribution. This is another hard decision for new users because there are a lot of distributions and flavors. After you learn one, you will not be satisfied until you check them all.

I checked out two distributions, which were more geared towards beginners, Mandrake and Red Hat.

Mandrake had better utilities and was much easier to use. It supports FAT, FAT32 and NTFS. Version 9.1 comes with the ability to resize your partition. Mandrake also has a very nice control panel for system administration. The good news is that it is based on Red Hat but modified for ease of use.

Red Hat supports FAT, but does not support NTFS, and if you need to dual boot, you need **Fat partitions**.

However both have very nice GUI's (graphical User Interface). If you are an experienced user, there are other flavors such as Suse, Debian, Slackware, and other distributions. If you learn one distribution the rest will be just as easy. The configuration files are basically the same. The difference is in the location of these configuration files.

The desktop may look different but all of them either run KDE or Gnome as its default graphical interface and all depend on the X-server.

No matter which distribution you use, you will need exactly the same thing. Most of the new distributions now come with automatic hardware detection. If for some reason your hardware is not detected you can still configure it manually.

Partition types

During the installation, the most important thing is your partition layout. You should always try to be professional when it comes to computers. A lot of people go to school, spend thousands of dollars and never learn the basics. Even most certified technicians don't know how to format a hard drive correctly. But unfortunately employers always look for that piece of paper, (like if that piece of paper will do the work). Trust me, when you place applications at a big company that's the first thing they ask you.

Remember! Practice makes experience. If you do something wrong during this installation, don't worry, everyone makes mistakes. If people wouldn't make mistakes; then nothing would be improved.

You will probably be better off if you do your installation on a clean hard drive without any operating system on it; otherwise, you might have to backup your files in case things go wrong. If you follow my instruction "as is" you won't have problems. If you have formatted a hard drive before, then you have the idea of how a hard drive is structured, or at least know how to make it operational.

** Before a hard drive can be used, it must be formatted. **

But what is a format?

A format is a unique preparation of a hard drive. It tells the operating system how to access the hard drive by creating a file system. First you have to tell the system what type of hard drive you have or it won't work properly. The system must have the correct parameters in the BIOS chip, such as Heads, Cylinder, and Sectors in order to recognize the correct size and of course enable the LBA (Large Block Addressing) option in the bios for big hard drives.

If you are installing a new hard drive, you must make sure that you have the correct setting before you start formatting your drive, or installing your new operating system.

Note: if you are wiping out an already installed hard drive you don't have to go through these settings.

Once the settings are correct you, start by creating partitions and then format. You can create a single partition or multiple partitions, the truth is that you must make the first

primary partition active in order to boot. If it is not active, even if it is primary, it will not boot.

Fdisk

SYNOPSIS

```
fdisk [-u] [ device ] fdisk -l [-u] [ device ... ] fdisk -s partition ... fdisk -v
```

DESCRIPTION

Hard disks can be divided into one or more logical disks called **partitions**. Linux needs at least one partition for its root file system (/root) but for efficiency we will learn which partitions are required to have it properly configured.

Invoking **Fdisk** displays a menu driven program for creation and manipulation of partition tables. It handles DOS, BSD and SUN type disk-labels (also known as disk slices).

In the UNIX world, **device** = (hard drive) uses the following convention for labeling the drive:

Examples:

IDE hard drives: /dev/hda, /dev/hdb, /dev/hdc

/ = root	/dev = device	/hda = hard drive A
----------	---------------	---------------------

For SCSI hard drives (/sda means SCSI drive A)

For ESDI hard drives (/eda mans ESDI drive A)

Note a **device** name, is followed by a partition number when created. For example, **/dev/hda1** is the first partition on the first IDE drive in the system. IDE disks can have up to 63 partitions, SCSI disks up to 15.

I want to make emphasis that when you work with Linux, The partitions can be done differently. **Fdisk** is not the only way to create partitions for Linux; as a matter of fact there are better options. After all you might end in a lot of trouble using fdisk. Instead of fdisk I will show you the best way how to partition a Linux box using a utility that comes with Linux called Disk Druid.

Understanding Mount Point /mnt

What are mounting points? Basically, mounting points are where you mount your file systems or devices. *Example:* If I wanted to mount my CD-ROM/DVD, I would login as root or super-user and type: `mount /dev/sdx /mnt/cdrom"x"`, where "x" is the device number. And /mnt/cdrom is a directory where the files will be exported.

Look at the following table for different mounted partition.

Moutpoint	Definition	What it holds
/	root	You can boot the system here or create a separate /boot partition
Swap	Swap	Temporary virtual memory
/usr	User	Store binaries, compiler libraries and user applications
/var	Variable	This partition must be large. It keeps the log, spools etc
/home	Home	Home users' directory
/tmp	Temp	The system keeps temp files
/mnt	Mount	Temporary mounting points

Table 1.2

In Linux, mount points can be mounted permanently or temporarily. For security purposes, you should only

Mount your devices under root's privileges.

Swap Partition: Use or Not to Use

In many cases you will appreciate the swap partition and other times the system won't need it at all. This only depends on the type of system you are setting up. Let say that you have plenty of RAM, say, 128MB+ and you are the sole user of the machine, you may not need it then. On the contrary if you are setting up a server machine then you definitely will need swap. Swap is where the virtual memory takes place. Check the system logs frequently to see if you ran out of virtual memory at any point.

Even if you know that you don't need swap, I recommend you create one about double the size of your physical ram.

Linux File Structure

Before we proceed with our installation I think it is a good idea to learn about Linux's file structure. The Linux file system structure is very much like an upside down tree. This tree is not difficult to understand; you will see this in details once your installation is finished.

Example:

Home = /user's Home Directory/me-you- she/he

Var = /print spool/named /logs/www

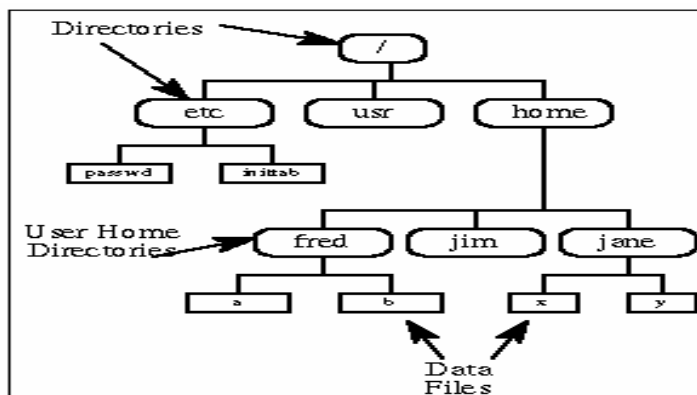


Fig. 1.0

Preparing for the Installation

I know you can't wait to get started. So no more blah...blah... here we go!

For detail purposes, I will explain the installation process of Mandrake 9.0 however the enclosed CDs are 9.1

Mandrake 9.0 is very descriptive in the installation process. Version 9.1 hides many of these features; however the process in the background is the same. For educational purposes 9.0 is perfect. I am sure that after reading this book, you will be able to install any version or distribution.

You may skip this section and go to 9.1 & 9.2 installations, but it won't hurt to read this section anyway.

Mandrake Linux 9.0 can be installed in number of ways. I will explain the two most common (and recommended) installation methods.

- Boot directly from the Installation CD, or
- Create a boot floppy if your computer is unable to boot from the CD

Only if your CD-ROM is bootable, insert the CD-Disk1 into the CD-ROM drive, restart the system and go straight to **Welcome to Linux Installation**.

If you are unable to boot from the CD-ROM, use the following procedure to create a bootable floppy disk or read "install.htm" located on the Installation CD for details.

When installing Mandrake Linux 9.0 onto a hard drive that already contains windows operating system, make a note of how much disk space is free for Linux to use. The bottom graphic shows an entire 8 GB HD, with 7.8 GB free.

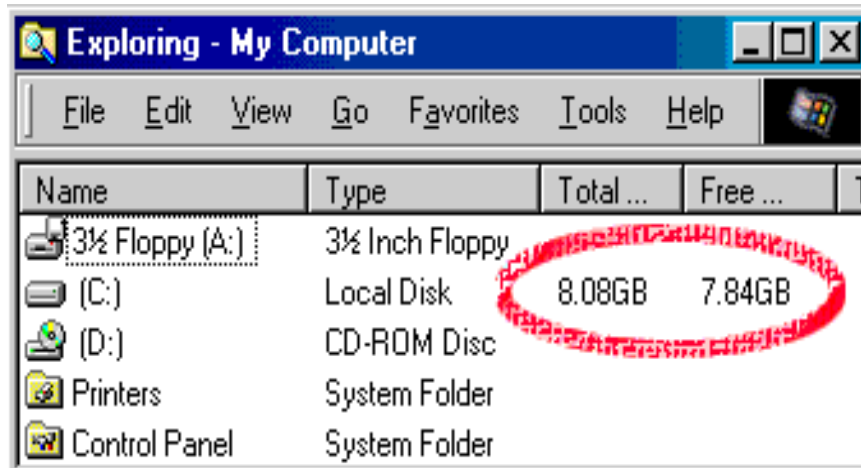


Fig. 1.1

To install Mandrake Linux onto a hard drive that already contains another OS; you will need to resize the existing partition to make room for Linux. This step can be performed within the installer (Mandrake 9.1), but before installing Mandrake, it is strongly recommended that you run scandisk. There are two choices you can use if you don't have free space but your hard drive is big enough.

- Buy a new hard drive for this installation
- Resize your existing partition

If you opt to install Mandrake 9.0, with resizing partition, you need to run scandisk and resize the partition with a third party utility such as Partition Magic.

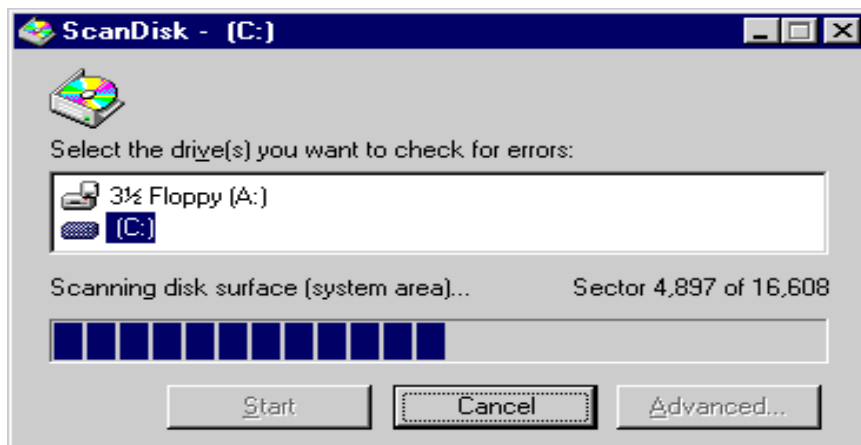


Fig. 1.2

Right after scandisk, run defragmenter.

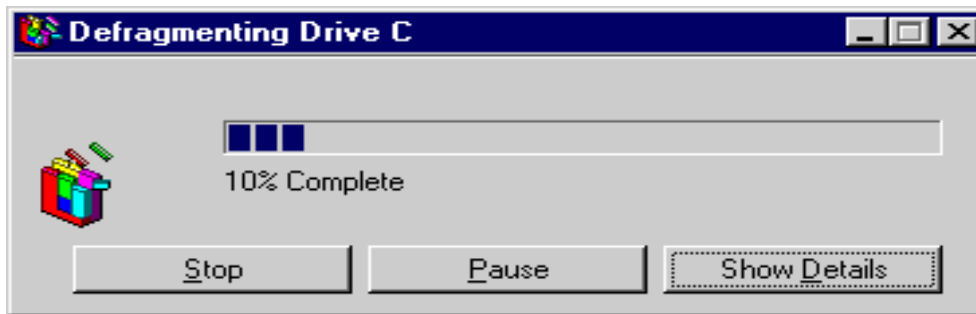


Fig. 1.3

For security purposes, back-up any data that you may need before installing Mandrake Linux.

Creating a boot disk

If your CD-ROM is not bootable then you must create a bootable disk floppy to start the installer. When you insert the CD disk1 in windows, it will "auto-run",

If auto-run isn't enabled, you can launch it by selecting "autorun.exe" from the "dosutils" directory of the Installation CD. See figure 1.4

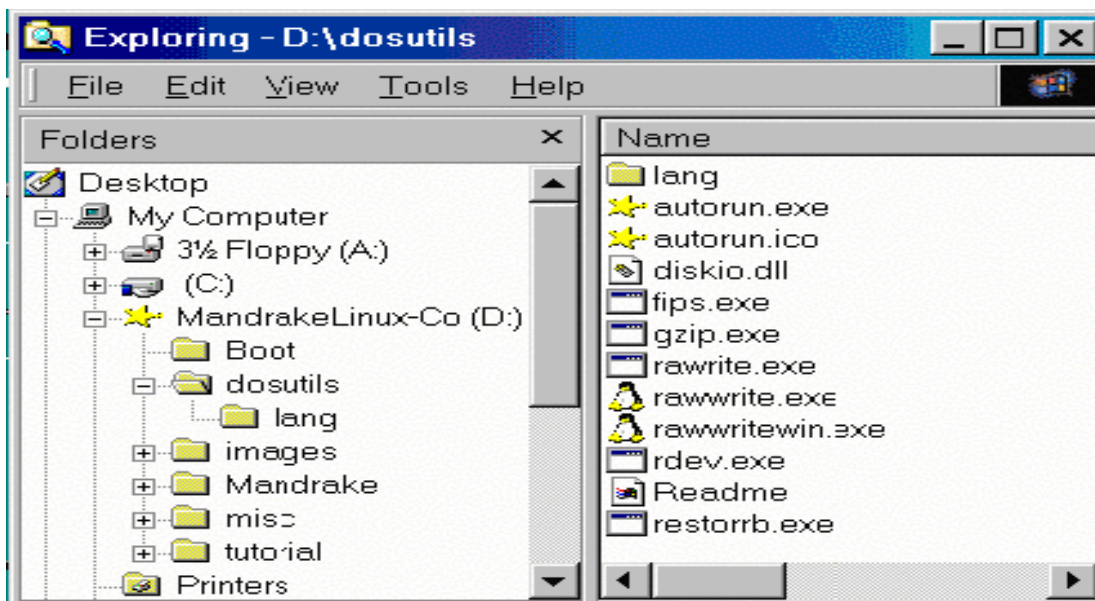


Fig. 1.4

Once auto run is executed you will see this screen, fig. 1.5

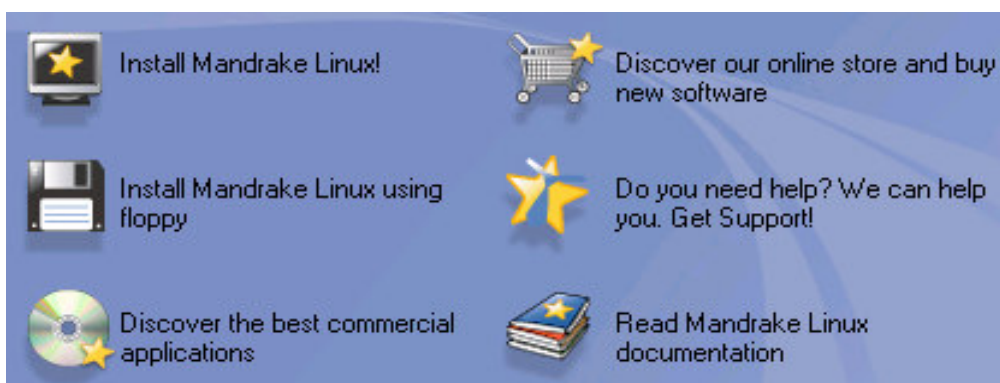


Fig. 1.5.

Click on Install mandrake Linux using floppy to create the boot disk.

Browse for the image file (for CD-based installation) called "**cdrom.img**" located in the "/images" directory of the Installation CD Disk1, see fig. 1.6.

- Select the image file
- Click on "Write" to create the boot disk.

After it finishes writing, leave the floppy disk in the drive and reboot your computer to start the installer. For other types of installations (such as network installations, hard drive, PCMCIA) you can create the disks from the other images.

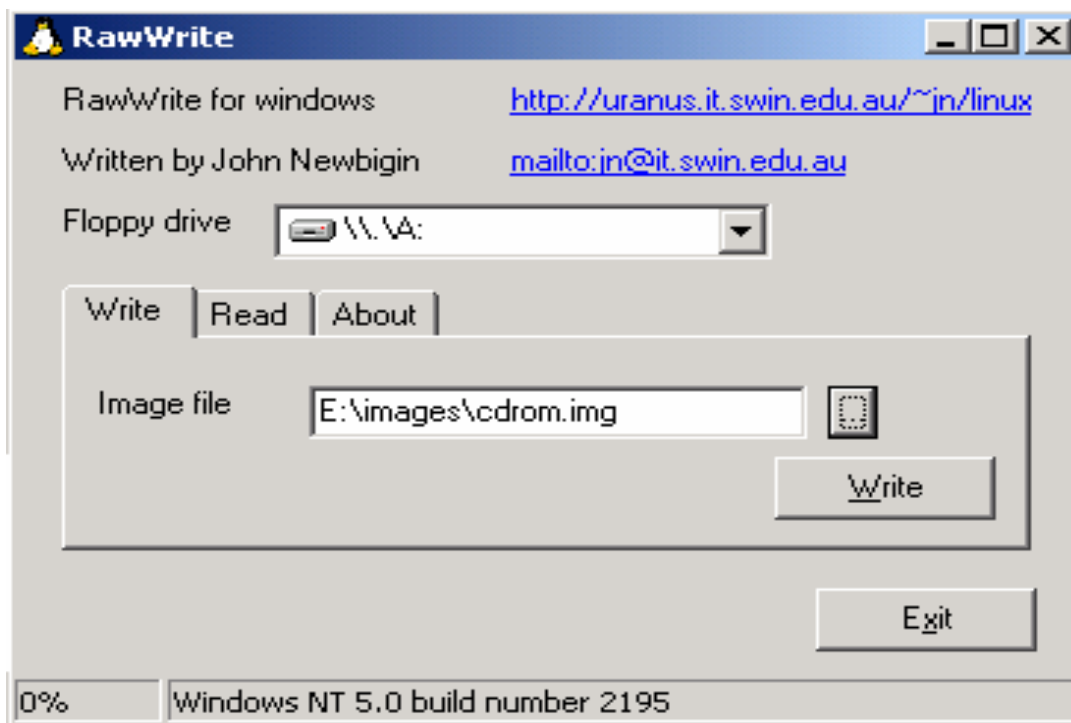


Fig. 1.6

At this point we are already in business. The installation should start by using the bootable disk you just created. If for some reason your floppy is ignored at the boot point, it is because your boot sequence in the bios is not set to boot from the floppy.

To boot from the floppy, you must change the sequence in the bios and make the floppy your first boot device. If you want to boot from the CD-ROM you will have to do the same thing change the boot sequence to CD-ROM as your first boot device.

Welcome to Linux Installation

The easiest way to start the installation is to boot directly from the CD; you'll then be presented with a startup screen similar to the one shown here.

Press **"Enter"** to start the installation, or press the "F1" key to display additional options, which may be used if you experience problems during the installation.

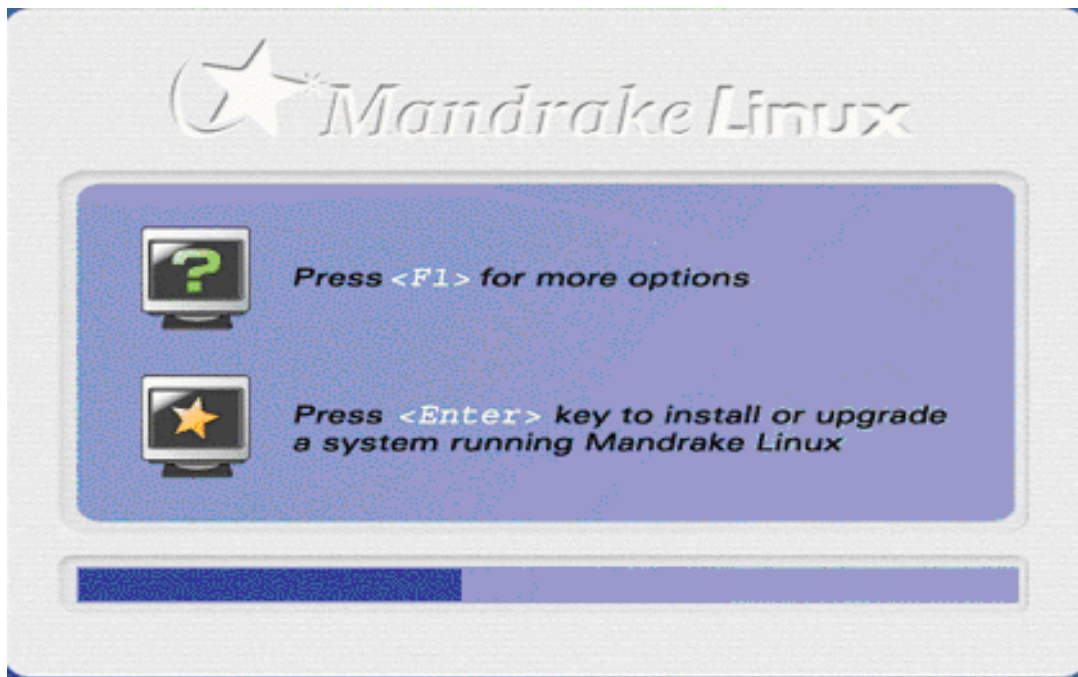


Fig. 1.7 First screen –starting your installation

The F1 option can be used to select a (**vgalo**) low resolution installation mode &

- Test installation mode
- Linux for standard Graphical install at normal resolution
- Expert graphical at normal resolution
- Or use the CD to start a rescue mode (ideal for reloading Lilo)
- Or pass Specific Kernel Options

The most useful option from F1 may be the: **The reinstall of the Boot Loader.**

Language Selection



Fig. 1.8

The installation is very straightforward, choose your language and **click ok**. **Click Accept** on the Licensee agreement, for the installation to proceed.

Installation mode

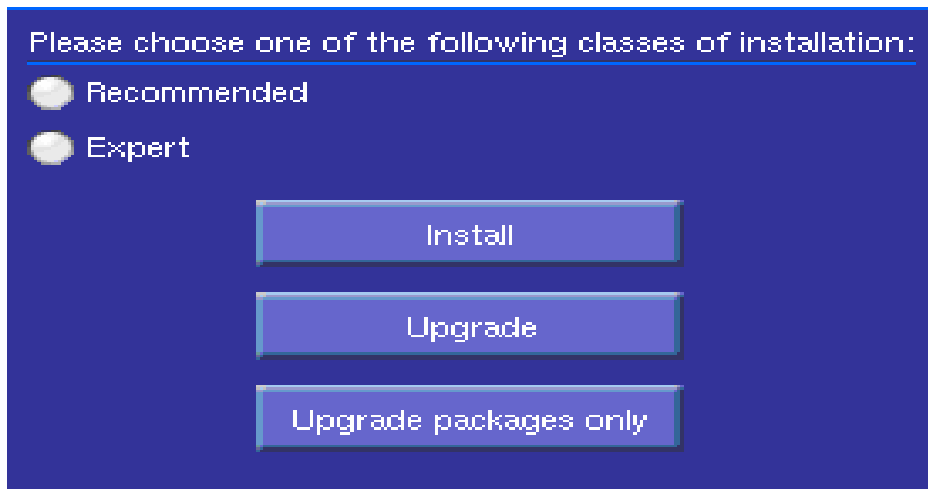


Fig. 1.9

This step is very important; it is the type or class of the installation. As you can see, **you can upgrade from here**. In our case, this is a fresh install

- Select the **Expert** mode and click install.

Hard Drive detection

Your hard drive will be probed next.

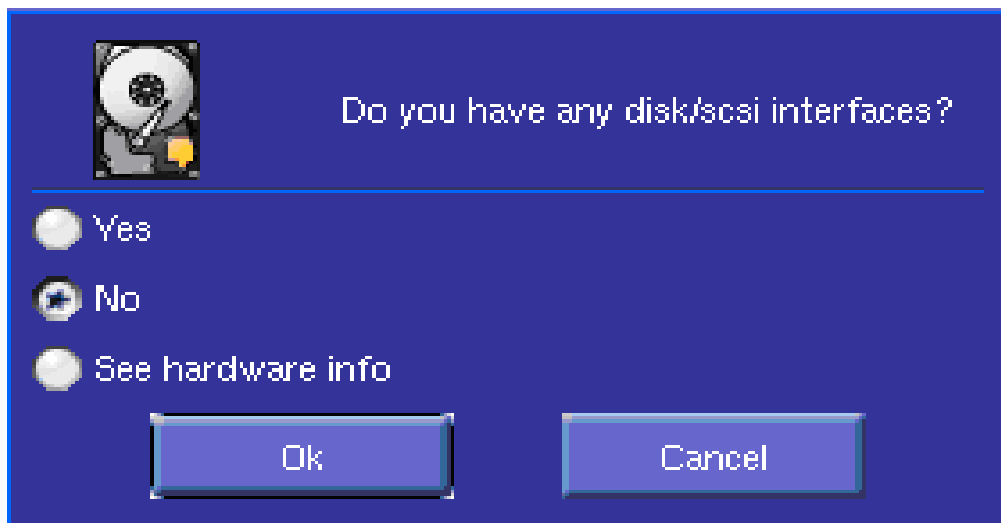


Fig. 1.10

- Answer the question **yes** or **no** and click Ok.

Your mouse will be probed next.

DrakeX usually auto detects the mouse, generally a standard PS2. If it is detected leave it as default. If you have a serial mouse and it is not detected use a generic two-button

mouse. But I highly recommend you use a PS2 mouse, buy one for just \$5.00 (not expensive).

Next you will select your keyboard layout.

Again normally DrakeX selects the keyboard based on the language you have selected. However the keyboard may not match with your language. You may manually select the correct keyboard by clicking on the [more](#) button and scroll down the list until you find the correct keyboard.

Security preset

If you already have experience with Linux you can go ahead and set your security here. This is one of the nicest features of mandrake because just right after the installation it is ready to go. If you know what you are doing you may set up your security here. As you can see it has a drop down menu for the security level, it also has an option to email the administrator.

If this is your first time installing Linux, then wait until we get to security later in this book.

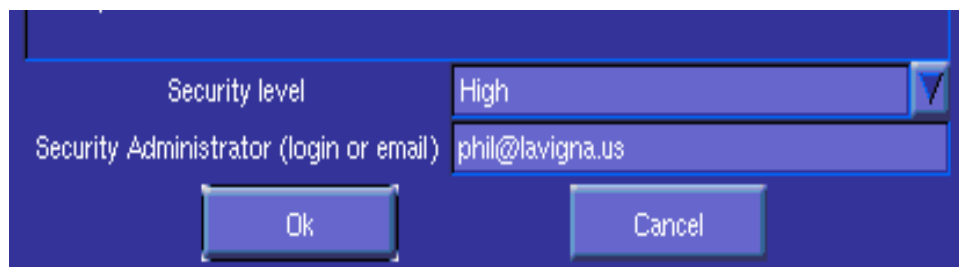


Fig 1.11

For our installation we will leave it as **standard**.

- Select **standard** and **click Ok**.

Partitioning

The next step is one of the most important things we will do during our installation. Here is where we configure and mount our partitions. As you can see at the top of the following picture it shows the types of file system you can setup. This picture is also demonstrating that it will be a dual boot installation.

If you are installing Linux on the remaining space of your hard drive, you better not mess with the blue part; because, if you do you will wipe out your windows operating system. I will be glad if you do! Just kidding...

Look at the picture. It is a basic standard layout installation for a dual boot. If you are just experimenting, it is ok. However for a higher standard we need to accomplish a better configuration.

Note: The following:



Fig. 1.12

This is perfect when you are running windows 2000 or XP, because even if you have NTFS you can still dual boot with Mandrake unlike other distributions. Remember if you plan for a dual boot you have to resize your partition, or do what I do. Grab a 40 GB hard drive install windows 2000 on the first 10 GB partition and format it with NTFS and leave the rest for Linux.

You might be wondering why I stress "with NTFS"; I am a security specialist and security is always my concern. When using windows you can always add some security to your system if you are using NTFS. FAT and FAT32 have no security at all.

If you are going to install or setup a server with Linux, do not configure a dual boot, or you will be sorry later. The following picture is what we need to accomplish for a server type system. Keep reading to see how it is created.



Fig. 1.13 Server type Partitions

Creating partitions with Druid

Now we are ready to create the partitions for our system. At this point you either choose or create a partition for the installation. You must pay attention if you have more than one hard drive in order to select the appropriate. For the first IDE hard drive would be: `hda` and for the second would be `hdb`, the first SCSI `sda` and so on.

When creating your partition you will see five useful options on the panel: **Clear all**, **Auto Allocate**, **More**, **Undo** and **Done**.

Clear all: Clears everything current on the partition table.

Auto allocate: Displays three options that allocates the partition automatically based on needs.

- **With /user**
- **Simple**
- **Server**

More: Under this option there are other options that you might need:

- Save partition table
- Restore partition table
- Rescue partition table
- Reload partition table
- &
- Removable media auto mounting

Undo: This option undoes any changes you just made to the partition before save.

Done: Use this **to save** the changes made to the partition table.

Sit back and relax, creating partitions is not that difficult when you are working with Linux. You will love mandrake after this installation; everything is visual. Other distributions offer visual but not intuitive as mandrake.

Any distribution that you decide to go with will be exactly the same at system level. Some are easy to understand and some not. I truly believe that after this installation you will be able to install any Linux distribution.

To begin manipulating the partition table, click on the blank space (remaining) of the hard drive and then click on **auto allocate**.

Option 1

1. Select the first option with **/user** and click **OK**

That will create:

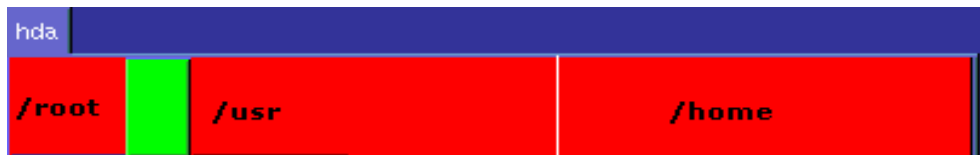


Fig. 1.14

If you decide to keep this option, Click on **Done** to save, otherwise click on **Clear all** or **Undo** (clear all, clears everything, including your current windows partition).

Option 2

2. Click on **auto allocate** again; now select **simple** and click **OK**.

That will create:

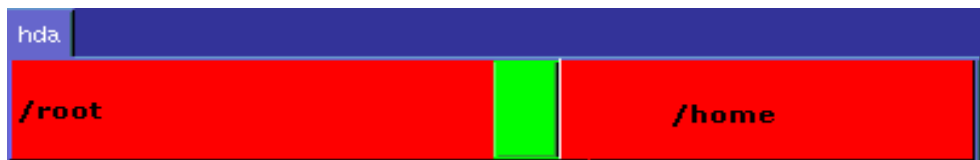


Fig. 1.15

Again if you want to keep this option, click on **Done** otherwise click on **Undo**, or clear all.

Option 3 (This option is what we need)

3. Click on **auto allocate**, this time select **Server**

This will create the most important layout that you will need for your server.

That will create:



Fig. 1.16

Once you **clicked ok**, the disk druid auto allocates the space for each partition. To keep this setting click **Done** to save.

Hey, this is just a demo. If you are not satisfied with the allocation size you can create the partitions manually.

Creating partitions manually

Creating partitions manually is the best way to learn about what types of file system are available. Once you become an expert you might want to try other file system, or maybe your project may require you to mount other file system. If that is the case, you must be ready when the times come.

Creating the /root partition

Click on the blank space of your hard drive, an option **create** pops up, right where it says choose action.



Fig. 1.17

- Click on **create** and you will see another popup window with:

- Start sector:
- Size in MB:
- File system type:
- Mount point:
- Preference:

You have to study this window carefully; here is where you set the size of each partition and the mount point.

- Do not complicate your life, leave **start sector** by default.
- To set the size, use the slide bar to set the desired size (about 400 MB).
- Leave File system type as: **Journalized FS: ext3** (*ext3 is an improved version of ext2*) if you want to select another file system type use the dropdown arrow.
- To set the first partition to **root** use the drop down arrow and select **/** ("**/**" stands for root, this first partition will hold all the files to start the system)
- That's it no preference
- Click OK,

Root partition just created.

To create the next partitions follow the same steps, but select each appropriate file system.

Create the **swap** partition:

- Click on the blank space of your hard drive
- Click on create
- Adjust the size in MB as desired (*use twice the size of your physical RAM for swap size*)
- Leave as: Journalized FS:ext3
- Mount point should be swap
- Click OK,

Partition swap created

Create the **/usr** partition

- Click on the remaining blank space of your hard drive
- Click on create
- Adjust the size desired
- Leave as Journalized FS:ext3
- Mount point should be **/usr**
- Click Ok

User partition created

Creating the **/var** Partition

The var partition is important, when deciding the size it should take some consideration. The var partition holds the information regarding the spooling system; such as spool of the mail server, printing, logs of the system and others. Depending on the system, when fully loaded the spools and logs can grow tremendously which could cause the system to slow in performance. My recommendation is make this partition slightly bigger than the others.

- Click on the remaining blank space of your hard drive
- Click on **create**
- Adjust the desired size
- Leave as Journalized FS:ext3
- Mount point should be **/var**
- **Click Ok,**

Var partition created.

Creating the **/home** partition

Here is where the users profile will be stored each time you add user.

- Click on the remaining disk space
- Click on create
- Adjust or set the desired size
- Leave file system type as **Journalized FS:ext3**
- Mount point should be **/home**
- **Click OK**

Home partition created.

Creating the **/tmp** partition

Yes you guessed it. This is the temporary directory. As you already know, it is used to store temporary files, for example when you go online this is where the system stores the pages you temporarily view.

- Click on the remaining disk space
- Click on create
- Adjust or set the desired size
- Leave file system type as **Journalized FS:ext3**
- Mount point should be **/tmp**
- **Click OK**

/tmp partition created.

That wasn't that difficult, was it? All your partitions are now created the next step is to save it on to the disk.

- Click on Done.

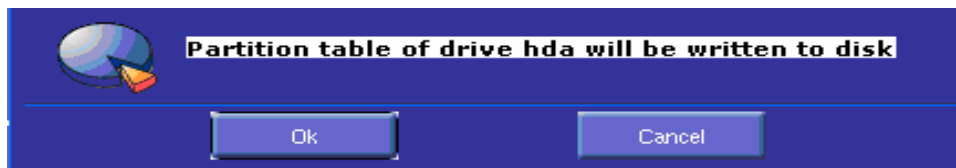


Fig. 1.18

Once you click OK, the partitions will be saved.

Formating Partitions

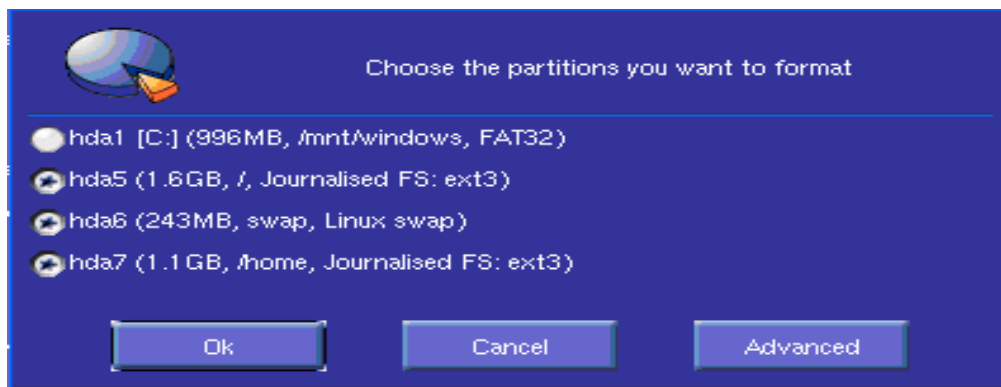


Fig. 1.19

At this stage you have to pay attention not to format your windows partition if you are setting up a dual boot system. The new partition that you just created should only be marked. After you verified, **click OK** to proceed with the format. After formatting is complete the file systems are permanently written to the disk and will be initialized every time the system boots up.

Selection of Software Packages

If you are aware of what you are doing, this is the most important part and reason of why you should have a big hard drive. The packages selection in the following picture is the most essential either for workstation or server. A 2.0 GB hard drive is not enough for all the default packages. Each package on the following picture has a subset of packages, which you can select next during the installation. Depending on what system you are setting up, you can select a few packages or select them all. The partitions you created in the previous section are perfect either for workstation or for a server machine. If you don't plan to use this machine as a server, of course you don't need to install the server packages. You can still add them later at any time.

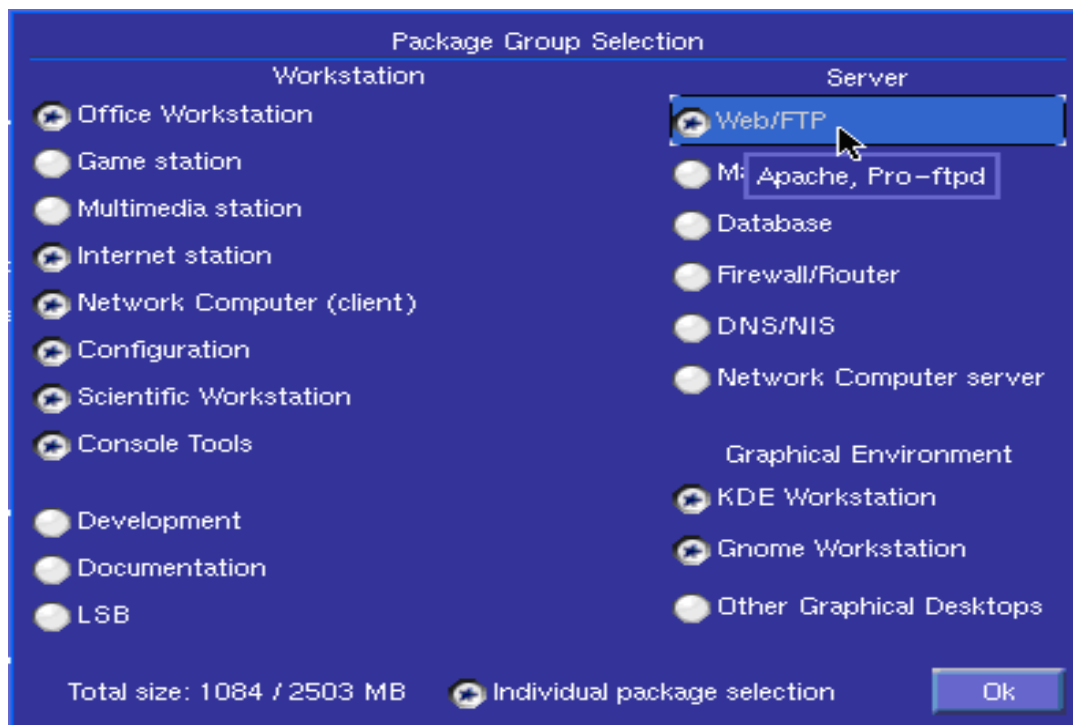


Fig. 1.20

Usually when I set up a machine, I select only what I need from this screen and when my installation is complete I still verify and stop all services that I don't need.

Let's go ahead and select the following software packages from table 1.3. Note that some of them you may not need... but it is good to know what they are. For example if you don't do programming; you don't need the development package or the game package if you don't play games. Or perhaps you want to learn more then you should install the documentation.

I suggest that you install those (doted) packages presented, so that you can see and experience the true Joys of Linux.

Work Station	Server
<ul style="list-style-type: none"> • Office workstation 	<ul style="list-style-type: none"> • Web/ftp
Game station	<ul style="list-style-type: none"> • Mail groupware/News
<ul style="list-style-type: none"> • Multimedia 	<ul style="list-style-type: none"> • Database
<ul style="list-style-type: none"> • Internet station 	<ul style="list-style-type: none"> • Firewall/router
<ul style="list-style-type: none"> • Network computer client 	<ul style="list-style-type: none"> • DNS/NIS
<ul style="list-style-type: none"> • Configuration 	<ul style="list-style-type: none"> • Network computer server
Scientific workstation	<ul style="list-style-type: none"> • KDE (Graphical interface)
<ul style="list-style-type: none"> • Console tools 	Gnome(Graphical interface)
Development	<i>Pause your mouse pointer on the package;</i>
Documentation	<i>You will see a short description.</i>

Table 1.3 Install doted packages only

Make sure Individual packages selection is selected.

- To continue with your installation **click OK**.

Individual packages selection

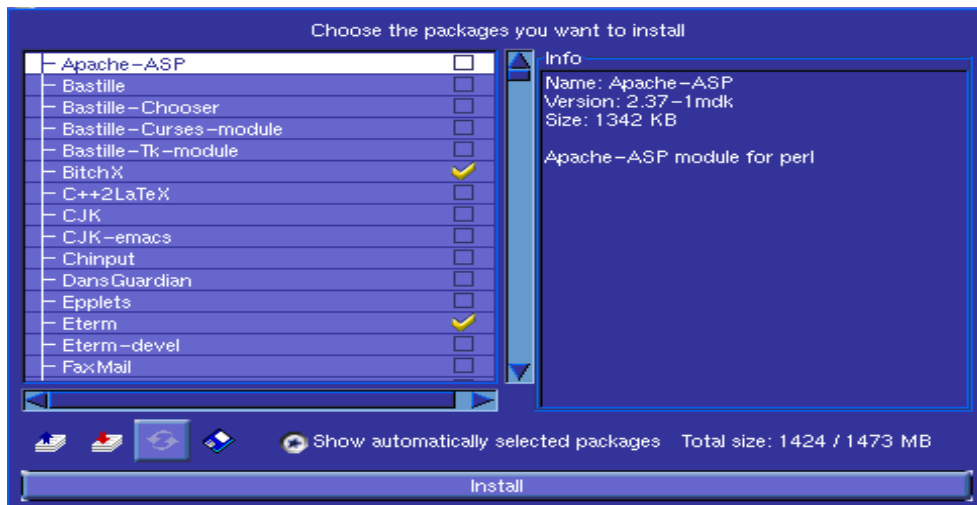


Fig. 1.21

From this screen you can select additional packages.

When ready click **Install**

Observe the icons at the bottom of the package selection screen you can use them to do the following when selecting a package name:



Expand the tree view



Collapse the tree view



Toggle between flat views lists all packages alphabetically, or sorted in groups. View the package description in the right panel by clicking on a package name with the mouse. To select a package for installation or removal, click checkmark after its name.



Press the floppy drive icon to load package selections saved during a previous installation.

You don't really have to select anything else on this panel, since mostly what you need was selected in the previous screen; I just wanted you to see what is available here for future reference.

- Click on **Install** to continue installation.

Installation approval

After clicking install you will be asked if you really want to install sever software selected, and it is warning you that it will be enabled by default. Security issues are involved.

- Click on **yes** to accept the warning.

Progress of the installation

Sit back and relax, Software installation will proceed automatically, displaying a progress bars until the installation is completed.



Fig. 1.22

If the installer requires packages from another CD, it will eject the current disk and prompt you to insert the required one.

The root account

Next you'll be asked to supply a password for the "root" account.

The root account is assigned to the system administrator for maintenance and has privileged access to all resources and settings of the computer. This account should be used only when necessary to tweak system configuration and is **not** for daily use. Keep the root password in a safe place, in your memory. It is the key of your system security. If you think your password has been compromised you should change it immediately.

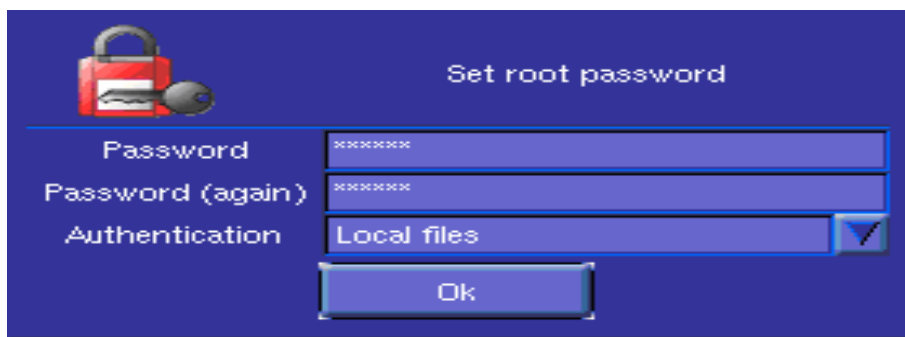


Fig. 1.23

On this screen you set up the root account, leave the authentication to local files. Remember always use strong password (letter and numbers).

A normal user account

You can also set up your regular user accounts next, same policy should apply to regular accounts (use a strong password; if it is compromised change it immediately).

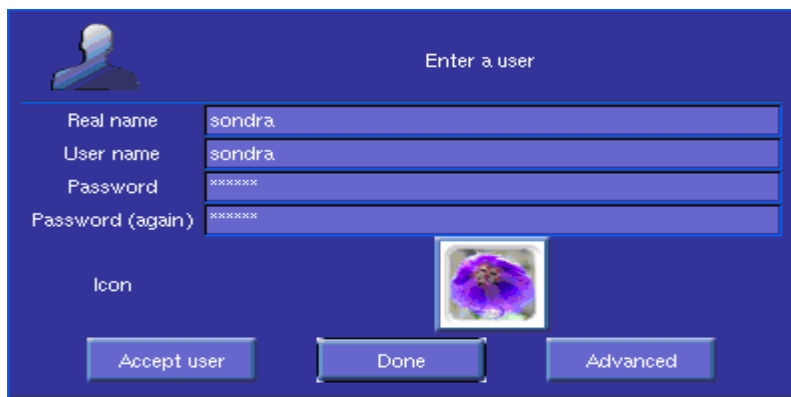


Fig. 1.24

You can add all your users here if you want to however we will learn more about system management later in this series.

- Click **Done** to continue.

Setting up the login mode

In Mandrake Linux 9.0, a user can be chosen to automatically login and be taken to the desktop. For security and troubleshooting reasons, click the **"No"** button.

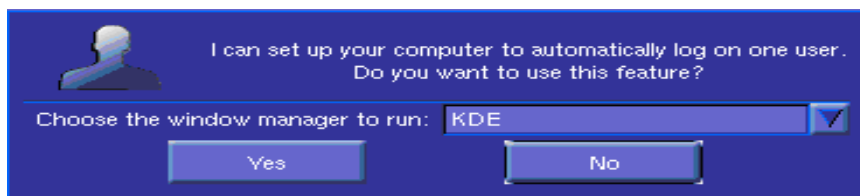


Fig. 1.25

Network configuration

On the next screen you can choose to configure the Internet and Network settings. Choose **"OK"** to have the installer probe your network devices, or remove **"Use auto detection"** to manually configure the appropriate settings.

Select the **"Cancel"** button to skip the Networking configuration. (*You should use this option, read ahead*)

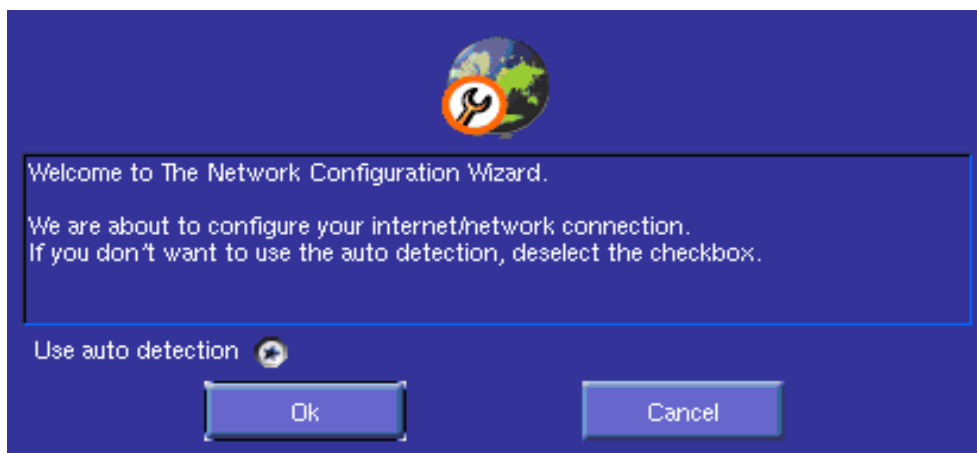


Fig. 1.26 The network wizard

If you know what you are doing, this is your opportunity to configure your network interface, otherwise:

- Click **cancel** to continue.

There is a simple trick that you might want to learn here. Most of the time it is hard to know what driver is required for the net card in order to work properly, or you may not even know what brand you are using. Auto detection will give you this information, pay attention to whatever you do. If you know TCP/IP, you could go ahead and try to auto detect the net card and enter the IP address you will be using. Take notes about the net card if you run the auto detection.

- Choose the configuration type and click **ok** to proceed with the setup.

You can press **cancel** at any time during the net card auto configuration process. By pressing cancel you will be brought back to the first screen (network configuration wizard). We will go through the network configuration later after the installation.

You learn more when you do things manually. Trust me it is the best way to learn especially when you get into trouble.

Summary of the installation

A summary of your installation is displayed.

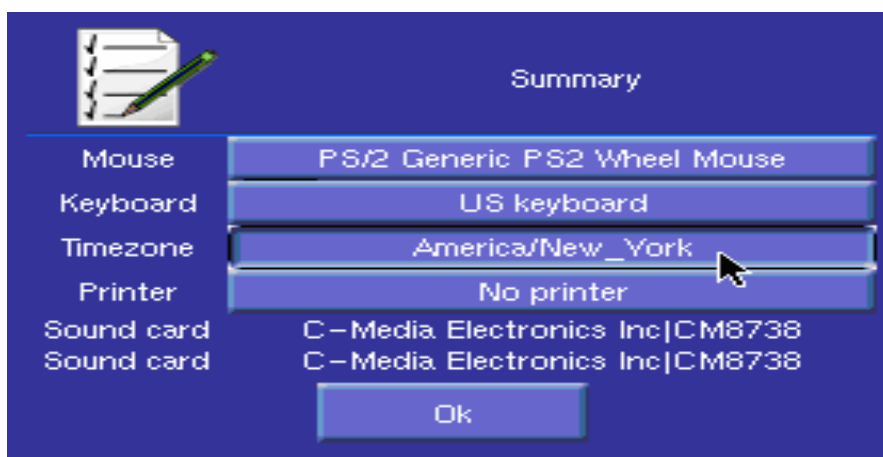


Fig. 1.27

The "Summary" window shows a list of settings that can be modified by selecting the appropriate button.

The time zone

The time zone might be already correct based on the language you selected earlier. Click on it to change it, if it is not correct.



Fig. 1.28

- Select your correct time zone and click OK.
- Select hardware Clock set GMT

Printing

CUPS, is the default printing system for Mandrake Linux 9.0, but "PDQ" (Print don't queue) is also an option. If you will set up a print server you should use cups. CUPS allow you to queue documents when a lot of users on the network are trying to print. You can install your printer now during the install process or wait after installation to use the Mandrake control center to install the printer.



Fig 1.29

The installation wizard gives you options to install:

- **Local printer**
- **Printer on remote lpd server**
- **Network printer (TCP/socket)**
- **Printer on Samba/windows 95, 98, NT and server**
- **Enter a printer device URL**
- **Printer auto detection local TCP and Samba**

After your printer installation, the wizard comes back to the summary windows click ok to continue.

Configuring Services

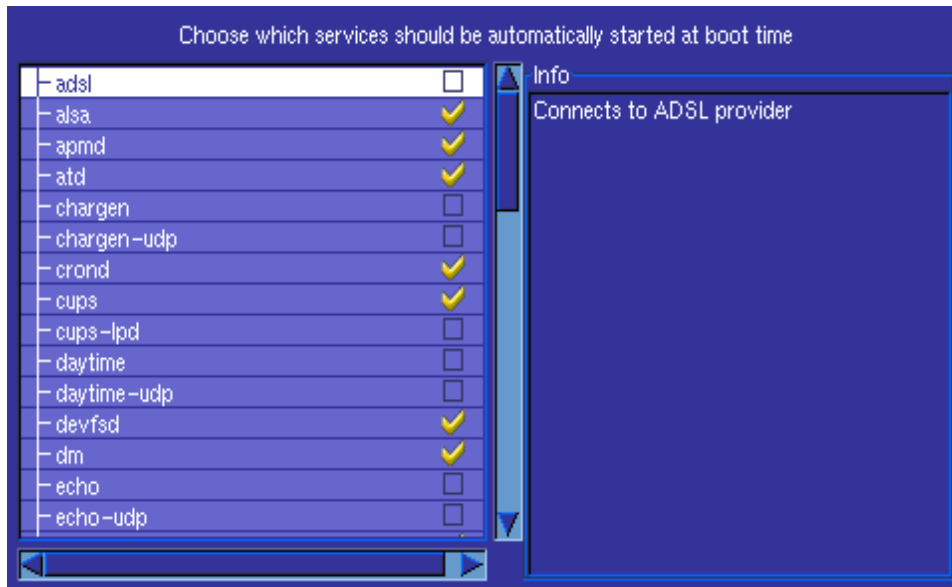


Fig. 1.30

On this panel you can configure what services to run at boot time. I am aware that you may not know what these services are; however, if you are an experienced user you can enable and disable them here. By clicking on each of them you can get a short explanation on the right panel about what they do. If you have absolutely no idea what they are for, don't try to change anything on this panel leave it as default. We will see more about services later.

- Click **OK** to continue.

The boot Loader

The installation wizard offers choice of boot loaders: GRUB, LILO with a graphical menu, or LILO with a text-based menu.

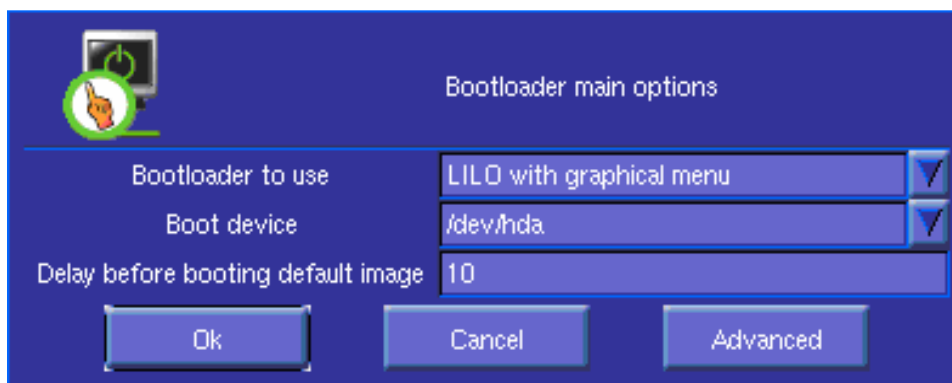


Fig. 1.31

You can specify where to install the Linux boot loader in the "Boot device" section. The default setting will install it onto the master boot record (MBR).

If you already use a boot manager (such as System Commander, Boot Magic, and NT boot loader) you could choose to install the boot loader in the root partition of your Linux system (or even on a floppy). Or replace your boot loader with Lilo.

Lilo allows you to boot multiple operating systems. After installation Lilo usually adds the existing operating system to its menu, or you can add it manually. I have been able to run Windows 2000 professional with NTFS, Linux Mandrake 9.0 and FreeBSD on the same machine with Lilo.

I don't usually experiment with boot loaders I like Lilo and I stick with it, but of course you are not me, so you are free to experiment with whatever pleases you. Experimenting will give knowledge to troubleshoot anything. In this installation choose Lilo with graphical interface. Leave the rest as default. Observe the following. The drop-down list shows the current boot loader entries. Additional operating systems (and kernels) may be added if available on your system.

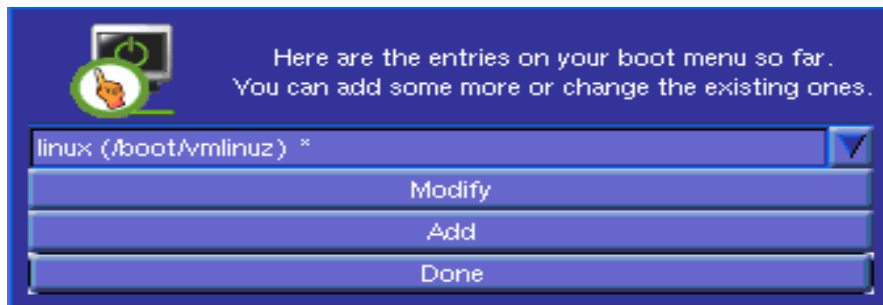


Fig. 1.32

- Click the **Done** button to continue.

The custom Boot Disk

The installation wizard will ask you to create a boot disk, which can be used in case of emergency to boot the system. However there is rarely need to do so.

Note: *The Installation CD also contains a rescue system; press F1 at the boot prompt to access Rescue mode. (Troubleshooting time)*

If you still want to create a boot disk click yes and you will be prompted to insert a floppy disk in the drive.

- Click **NO** to this prompt

Configuring X

At this stage of the installation, you will be configuring your video adapter, monitor and of course, here you have the option to set the resolution for your monitor.

DrakeX has been improved tremendously. Most models of monitors and video cards are in its database. The specs of your monitor might be detected as generic. You should accept that. If for some reason a device is not detected, you will have to specify it manually. Have the specs ready (brand, model, horizontal and vertical refresh rate, amount of memory on video card)

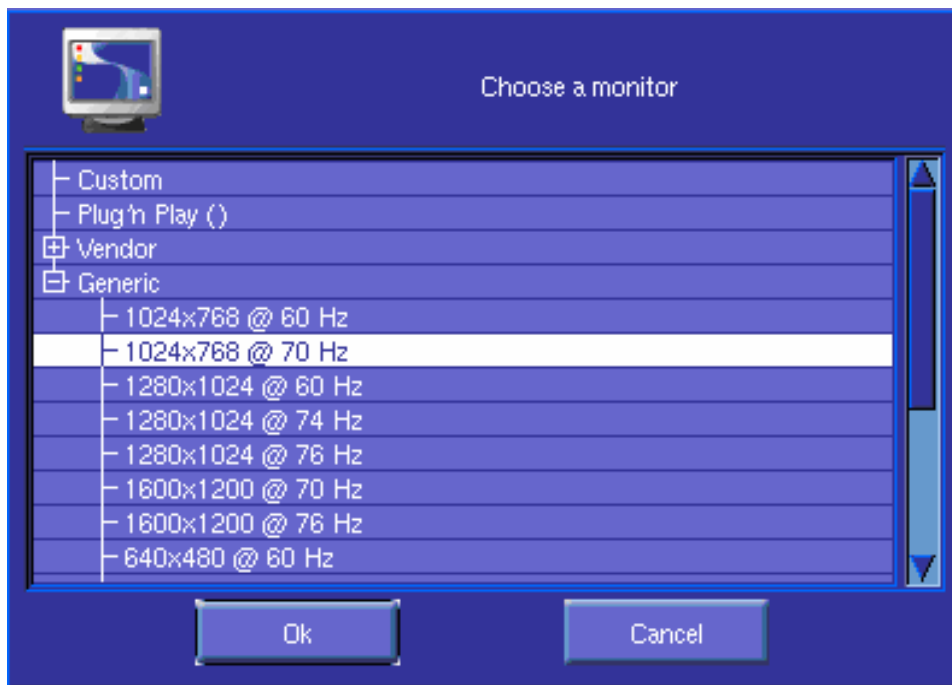


Fig. 1.33

The X server

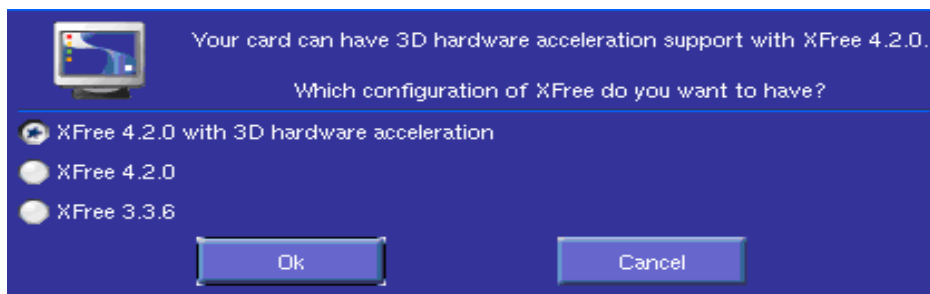


Fig. 1.34

XFree 4.2.x is the default video server for Mandrake 9.0, but the older XFree 3.3.6 is still available. If your particular video card supports 3D hardware acceleration, it will be offered as an option.

- Accept the option Click **OK**.

The next section is setting up the video resolution for your monitor; the picture below shows a perfectly detected video card with a monitor supporting 1024 x 768; if your resolution is below this try to adjust it to match 1024 x 768 for the desktop to fit properly on the screen.

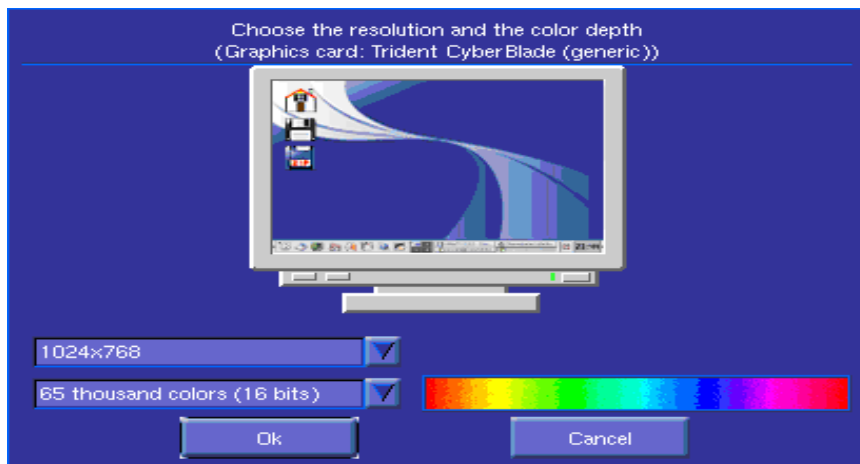


Fig. 1.35

If you got this far, you are in business. Now you can select the desired resolution and color depth for your display.

- Click **OK** to continue and test the configuration.

The video will be tested, the test screen should appear. If the test screen looks OK, choose **"Yes"** to continue. If your display doesn't appear correctly, choose "No" to try some alternative settings.

Setting up the boot mode

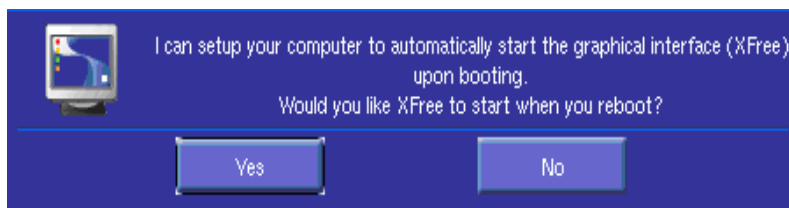


Fig. 1.36

X can be set to launch automatically at startup to provide a Graphical Login, **We don't want that, just yet.** If your monitor or video card is not set correctly you won't be able to login at a command prompt for troubleshooting.

Note: *Even if your video tested OK in the previous step. I don't recommend you login graphically.*

- Answer **No** to this option

The update Option

By the time you install Mandrake Linux 9.0, it is likely that some software packages have been updated since the initial release. Here you will be prompted to update your current edition. You will only answer yes to this question if you configured your Internet connection during network configuration earlier in this chapter. For security reasons don't do this. But if you answer yes to this option, it will list several mirror sites for your download and prompt for packages selection and installation.

- Answer **NO** to this Option.

Congratulations

Finally the congratulation screen pops up, prompting that your installation is complete click **OK to finalize and reboot.**



Fig. 1.37

Or click on Advanced for other options.

The advanced options generate auto install floppy – On this floppy record the settings chosen during the installation. These settings can be used on new machines that need to be configured in the exact same way.

Save package selection - This records the software packages, which were selected for this installation. When complete, remove the floppy and all optical media select **"OK"** to restart the computer. You can then boot into Linux or MS-Windows (if applicable).

Congratulations you just have installed Linux...

Installing Mandrake 9.1 & 9.2

Welcome to the installation of Mandrake 9.1 & 9.2, perhaps one of the most intuitive version among all distributions available. I decided to include this section for all of those who always like to be ahead and current to the changes of technology.

The installation process of Mandrake 9.1 differs a little in comparison to the version 9.0 installation but is very similar to 9.2. Follow the instructions installing Mandrake 9.0 to create the boot up floppy disk if you need it, otherwise just make sure your first boot device is set to CD-ROM and insert the installation CD1 into your CD-ROM drive to start the installation.

Observe the first screen by pressing Enter it will proceed with the installation. If for some reason you need to troubleshoot or simply because you are having trouble installing in the graphical mode, you can accomplish the installation in text mode by pressing F1 instead.

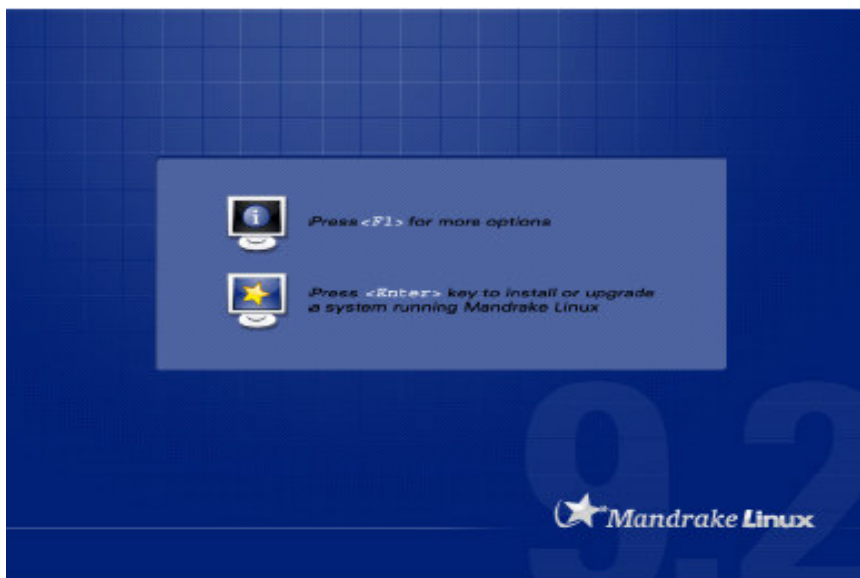


Fig. 1.38

- On your first screen, press **enter to start the installation.**
-
- For text mode installation or troubleshooting purposes press F1.

```
Welcome to Mandrake Linux install help

In most cases, the best way to get started is to simply press the <Enter> key.
If you experience problems with standard install, try one of the following
install types (type the highlighted text and press <Enter>):

o ugalo for low resolution graphical installation.
o text for text installation instead of the graphical one.
o linux for standard graphical installation at normal resolution.
o expert for expert graphical installation at normal resolution.

To use this CD to repair an already installed system type rescue
followed by <Enter>.

You can also pass some <specific kernel options> to the Linux kernel.
For example, try linux mem=128M if your system has 128Mb of RAM but the default
kernel (2.4.21pre4-0mdkBOOT) does not detect it correctly.
NOTE: You cannot pass options to modules (SCSI, ethernet card) or devices
such as CD-ROM drives in this way. If you need to do so, use expert mode.

[F1-Help] [F2-Advanced Help] [F3-Main]
boot: _
```

Fig. 1.39

Observe the screen, and note that it offers you four options. At the boot prompt, you can pass special parameters to the kernel. To make your life easier when installing in text mode, just type **text** at the prompt.

After you have pressed Enter, you are prompt to select your language. Be aware that your language may not necessary match your keyboard.

For example, one can select Spanish as the language but the keyboard is 100% English. In this situation you would use: US keyboard (international) on the other hand select the correct one.

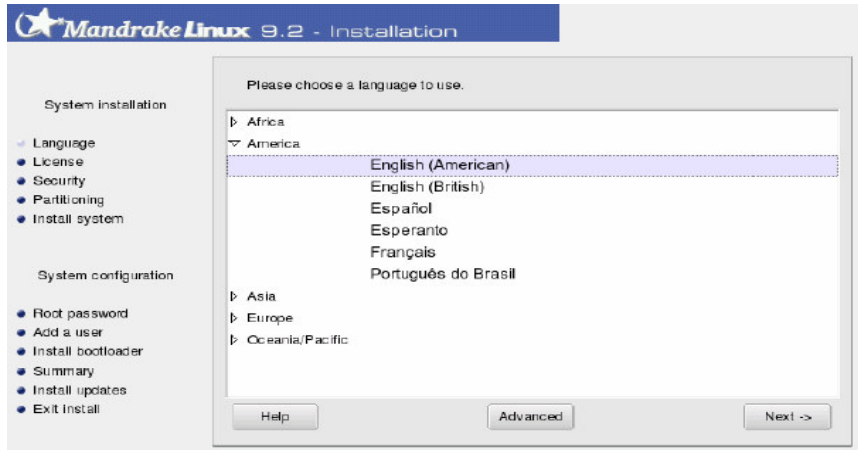


Fig. 1.40

- Select your language
- Click on **Next**

If you want to select additional languages click on advanced, select the language and click on **Next**.

- Select **Accept** the license
- Click on **Next**

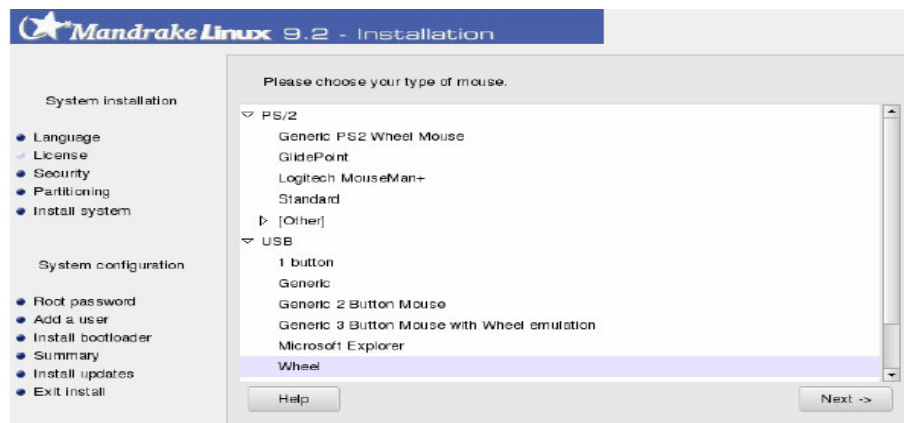


Fig. 1.41

- **Select your mouse type**

Note. *If your mouse is a standard two button PS/2 mouse, leave the default to standard or Generic PS2 wheel mouse if it is a wheel mouse.*

- Click on Next

Installation Class

Install or upgrade?

You have the option of a fresh install or to upgrade from an existing version.

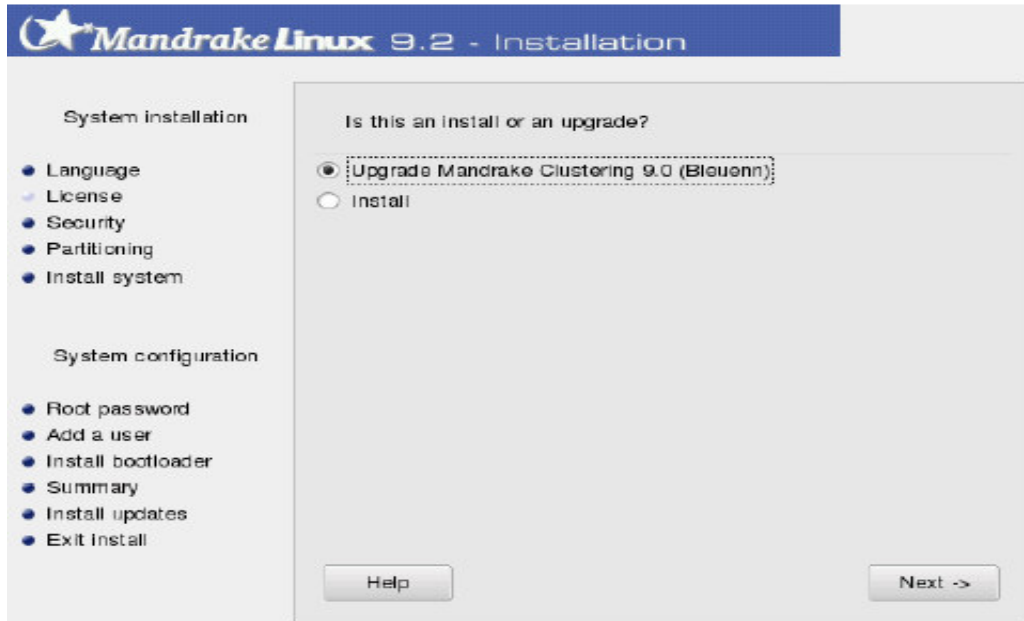


Fig. 1.42

- Select install for a fresh installation
- Click Next

At this point you are prompt to select a security level (**firewall preset rules**), if you already have experience and know what you are doing, you can set the security on this screen.

I do not recommend setting a high security here because you may not be able to troubleshoot later in case you are having problems connecting to the Internet etc.

- Leave the security level as Standard
- Click Next

The Drake X Partitioning

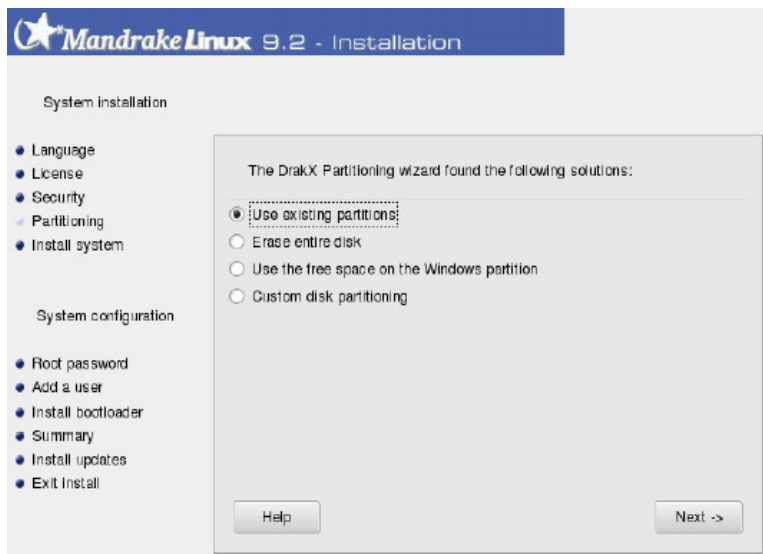


Fig. 1.43

Depending on your situation you will have to consider this screen. Some user will opt for dual boot some not. Your situation however may require special attention! To make this simple for everyone:

- **Select Custom disk partitioning.**
- **Click Next**

Custom disk partitioning, will allow you to manipulate the drive in expert mode, especially if you resized your existing windows partition. You probably don't want to wipe out your windows if you are planning a dual boot!



Fig. 1.44 The blank (white) space is the remaining part of the hard drive available for this installation.

For instance observe the above picture, it shows an existing windows partition. And the only way to keep it there is by selecting custom partitioning from the previous screen.



Fig. 1.45

If the drive is brand new or no partition at all it should look like figure 1.45.

Where **hda** will represent your first IDE hard drive

At the bottom of this screen you have the following buttons, which will be used to create your partitions:

Clear all	Auto allocate	More
------------------	----------------------	-------------

Clear all: Clears everything including your windows partitions.

Auto allocate: This option creates the /root partition, the swap partition and /home partition.

More: Display other buttons such as **save partition, restore partition table, Rescue partition table and reload partition table.**

At the bottom of this screen, there are other four main buttons.

Help	Undo	Toggle to expert mode	Done
		Toggle to normal mode	

Undo: This option undoes any changes before saved.

Toggle to expert mode: This is the preferred button for creating the necessary partitions.

Done: Clicking on this option will save and format the partition created.

- **Click on toggle modes**

[When switching to expert mode, normal mode is displayed on this button.]

Many more options are available on the choose action panel.

Actions:

- **Mount point**
- **Type**
- **Options**
- **Resize**
- **Format**
- **Delete**

Now if you click on Auto allocate, the following options are available:

- **With /usr**
- **Simple**
- **Server**

The option we are interested in is the **server option** even if you are planning on a workstation installation only.

If you already planned to use the entire remaining part of the hard drive, just select **auto allocate with server option** to create the following partitions.



Fig. 1.46 Server layouts

This partition is auto allocated when server option is selected.

If this option does not satisfy your needs, click on undo and click on the blank part of the hard drive and on the **choose action**

- **Click on create.**

This will allow you to create partitions manually (set the size as you prefer). Refer to creating partitions manually in Mandrake 9.0 installation.

Once the partitions are created, click on **Done**. You will be warned that drive **hda** will be written, **click OK**. The partitions will be formatted.

Package Selection

The next step is package selection; you have two options **workstation** and **server**. Observe the following table for the package selection.

Package Group Selection	
Workstation	Server
<ul style="list-style-type: none">• Office workstation Game station <ul style="list-style-type: none">• Multimedia station• Internet station• Network computer client• Configuration Scientific workstation <ul style="list-style-type: none">• Console tools• Development• Documentation LSB	<ul style="list-style-type: none">• Web/FTP• Mail• Database• Firewall/Router• DNS/NIS• Network computer server• KDE Workstation

Table 1.3

You can select all the packages from this screen if you need them, but the screen is split in two in order to differentiate the installation. If you are planning to use your computer as a client in your network choose the workstation packages, with the workstation you have all the office applications including the internet applications.

On the other hand, if you are planning to use this as a dedicated server, just install the server and server packages you need (with the Internet station from the workstation package)

For educational purposes you can select them all, if you have enough hard drive space, or follow the above table and install only the dotted packages. Once your selection is complete, click Next and a warning of services will display explaining that they will run at boot.

- **Select yes**
- **Click next**

The software is being copied onto the hard drive, depending on your packages selection; you will be prompted to swap CDs.

When finished copying all selected packages, you will be prompted to enter a password for your root account.



Fig. 1.47 *Creating a password for root*

- Enter the password for root
- Click next

After entering the password for root, you can also create a regular user

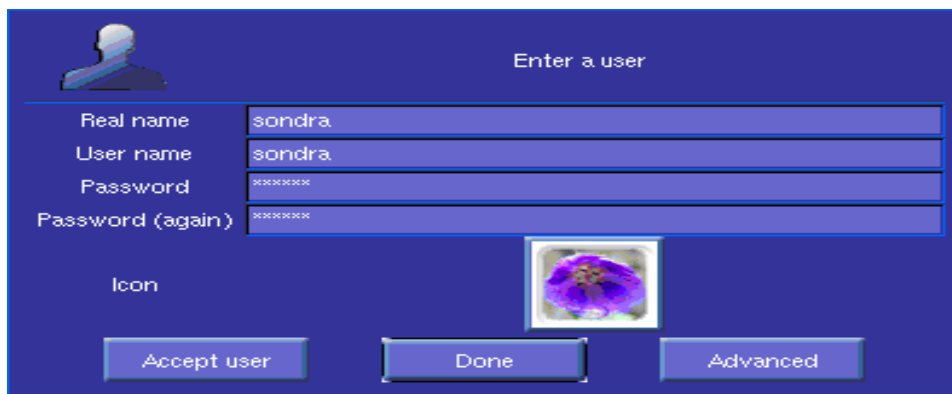


Fig. 1.48 *Creating a user*

- Enter the user name
- Enter the user's password
- Click on the icon, to select an appropriate icon for the user if you wish (optional).
- Click next

Unselect the option that says "I can set up your computer to automatically log on one user"

- Click next

Setting your boot loader

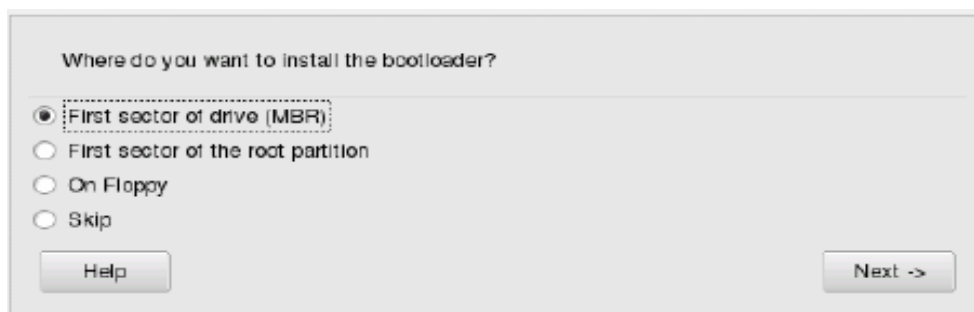


Fig. 1.49 *Installing the boot loader*

- Select master boot record of drive (MBR)
- Click next

The next screen is the global system hardware configuration in the system and most are detected automatically. There will be some that are not configured or detected properly. Most likely the hardware that is not configured properly will be highlighted in red.

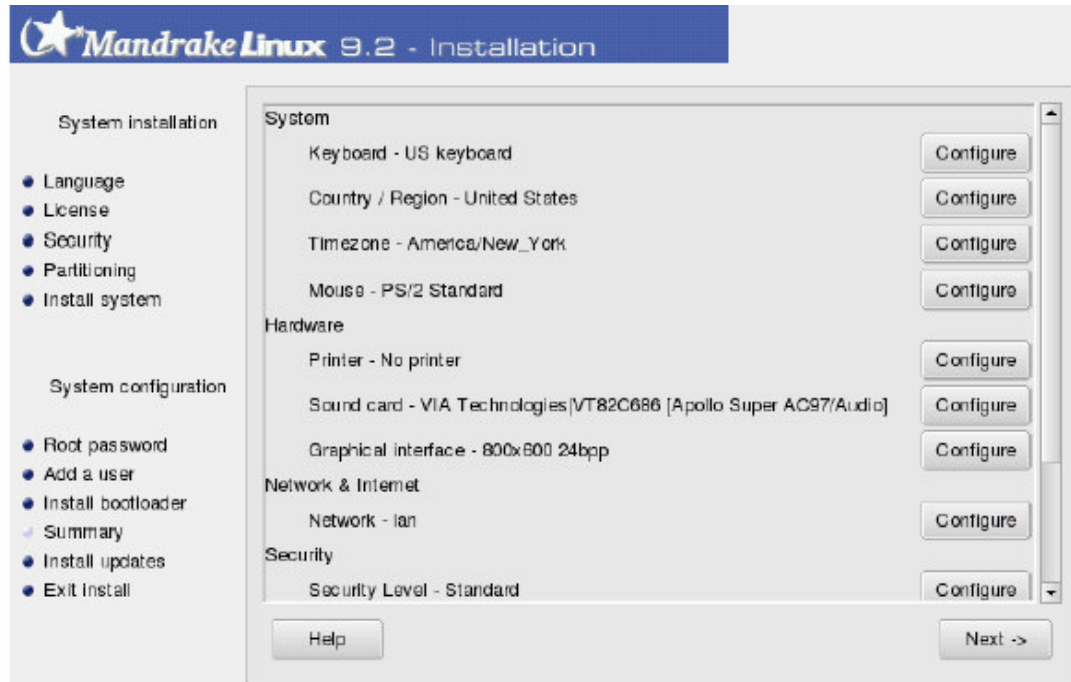


Fig. 1.50

A primary example here might be the graphical interface. To configure it click on the configure button on the right. When you click on configure, the monitor is probed and the refresh rate is detected. The detected **mode** is highlighted, leave as default and click next

Configuring X

It is configured by detecting the proper Video card. The X server most likely will detect the correct video card, but you should verify this by having all the specs of the system on hand.

- If the detection is correct click next
- Choose XFree 4.3
- Click next

Once the X server is configured the next screen will present the resolution for your monitor, use the drop down arrow to select a higher resolution such as 800x 600 or 1024x768.

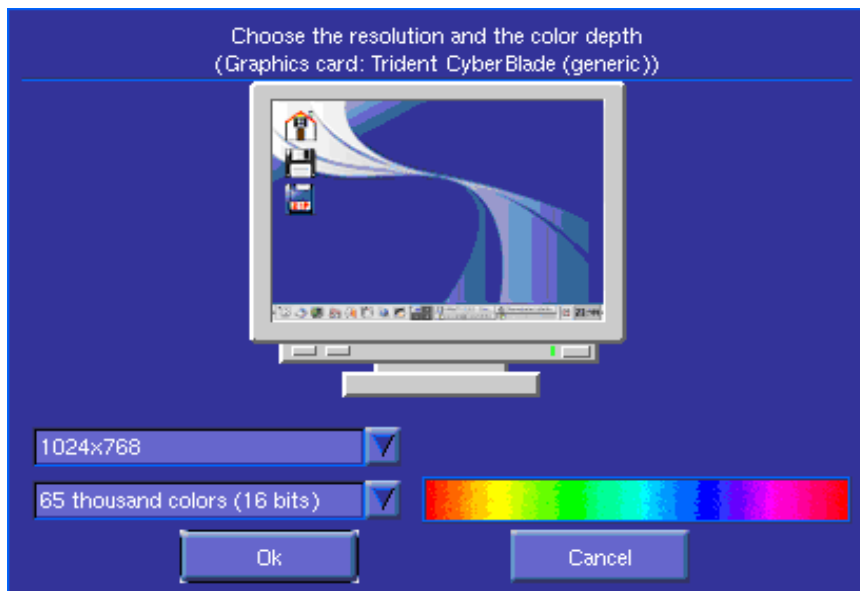


Fig. 1.51 Set your resolution here

If the video interface was detected previously, then you should see a summary, as shown on figure 1.52 This indicate that your system is properly configured and shouldn't have any problem loading the graphical interface. To prove it, you should test it.



Fig. 1.52

- Click OK
- Do you want to test the configuration?
- Select yes
- Click next

If your resolution is appropriate click **yes**. It may bring you back to the summary screen. In case that you need to reconfigure any of these settings, just click on any of the buttons and it will take you to the respective configuration panel.

- If everything is correct, click next

A question pops up, suggesting setup the computer to automatically start the graphical interface up on booting, would you like that option?

- Select **No**
- Click **next**

You are back to the global configuration panel, at this point you shouldn't see any red [highlighted] that says not configured, and if that is the case everything is now configured

- Click **next**

The update option

This option will try to download updates from the Internet at this point your connection is not ready.

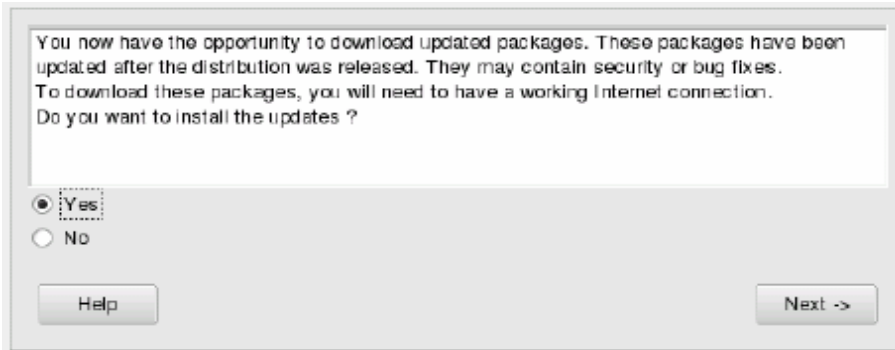


Fig. 1.53

- Select **No**
- Click **next**

Congratulations

The last screen presents two other important options:

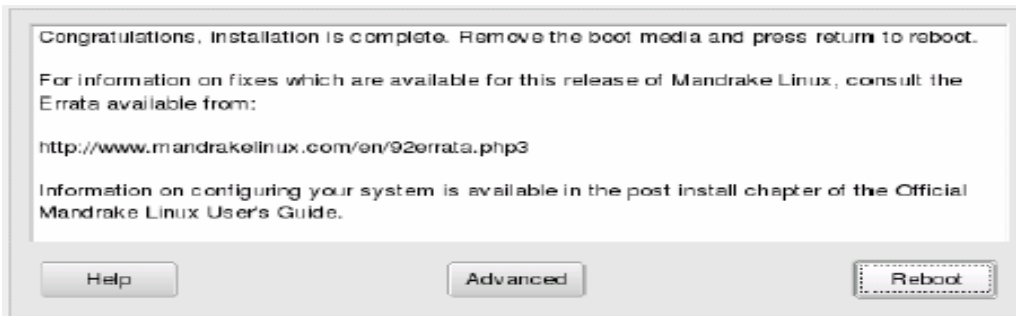


Fig. 1.54

- Advanced and Reboot

The advanced button: This option could be used to create an auto install floppy with the entire previous configuration and use it on a similar system

- Click on reboot

You can now remove the CD for the system to restart normally. You should get a login prompt.

Congratulations you have successfully installed your Mandrake Linux.

Chapter 2

The Internet

Quick Start

I thought to include a quick start for all of you. I am a technical person and I really hate that book that gives you 99.9% blah...blah...without getting you anywhere. Not all people are like me, and not all people are like you. So I thought to write this book for everyone that has different taste.

If you are like me then you are going to love this section. One can read 400 pages but it is just a waste of time, because you have to read all in order to grab some essentials. That is exactly the same as when you go to school and spend six months, five thousand dollars for training, and when you're finished you don't even know how to format a hard drive.

I know time is valuable. Having that in mind, you should be proud of yourself because after you finish reading this book, you've just graduated. And if you are lucky to hold a certification, congratulations! Now you've earned it... For God's sake learn and master what is in this book.

Through out the decade, Linux has become one of the most powerful operating systems. I truly believe that sooner or later Linux will defeat the dinosaur as it already did in the server arena and within a few years Linux will govern the desktop. Currently Linux is already in many offices, including college and universities at the desktop level.

As I said, Linux is so powerful because whatever you can imagine, you can now do. In order to master the secret of this operating system, you have to learn the commands. In this section I will give you an intro to commands so we can move around to accomplish the task I have planned.

Reboot the computer and login:

Mandrake Linux release 9.0 (dolphin) for i586
Kernel 2.4.19-16mdk on an i686 / tty1
Localhost login:

If you created a regular user account during the installation, you can login with that user now, but if you did not create a regular user account, then just login as root.

Login as root

Localhost login: root

Password: type the password

(note when you type the password, you can't see it)

[root@localhost root]# *This is the prompt for root (administrator)*

Login as a normal user

Localhost login: agustin

Password: your regular user's password

[agustin@localhost agustin]\$ *This is the prompt for regular user*

Creating a new user

If you don't have a regular user account yet, then you need to create one. You have to be root to do this.

```
[root@localhost root]# adduser user1 (user1 is the actual user name)
```

Now set the password for user1 (give your user1 a password).

```
[root@localhost root]# passwd user1 (granting user1 a password)
```

New UNIX password: *type the password for user1 here*

Retype the password:

If the password is a dictionary word you will receive a bad password warning, you can still use it, but keep in mind that it is a very weak password (easy to crack). Retype it for the system to finish setting the password. When the password is accepted you will receive the following message: all authentication tokens updated successfully.

Well you just created a new user, which is the beginning of system administration. From now on, you should login as your regular user and every time when you need administrative privileges you just switch to it. So **logout now, and re-login as regular user.**

Working as normal user

Your prompt should be now:

```
[user1@localhost user1]$
```

At your command line you can execute almost anything, but some commands will not be available to you as a regular user unless you become **super-user or root.**

Anyway let's try some basic commands so you know what they do in case you need them.

```
[user1@localhost user1]$ ls
```

The **ls** command lists the current directory, you can use it with several switches: **-R** recursive, **-S** sort by file size, **-l** use long listing format, **-a** all.

For more switches type **man ls** at your command prompt to view the manual. After scrolling down the manual press "Q" to quit the manual.

```
[user1@localhost user1]$ cd /home
```

The **cd** command is used to move between directories. Notice the forward slash it is very important in Linux.

```
[user1@localhost user1]$ cp
```

cp [OPTION] SOURCE DESTINATION

The **cp** command is used for copying, useful to move and for backing up small portions of files. You can only copy files where you have permission.

```
[user1@localhost user1]$ mkdir mywork
```

The `mkdir` is used to create directories. You can only create a directory in places where you have permission to do so. By default you have permission to write and delete in your home directory. If you become a super user, you can write anywhere you want. Be organized!

Become a super user

While logged in as a regular user, you might temporarily need root's privileges in order to do something that only root can do. You don't have to logout to gain this power.

```
[user1@localhost user1]$ su
```

At your prompt type **su**, that will ask you for a password. That password is root's password, type it and hit enter.

Now your prompt should look like this:

```
[root@localhost user1]#
```

Note inside the brackets says root, and now you have root's power to do anything you want.

```
[root@localhost user1]# exit
```

To exit root's privileges just type **exit**.

Getting online

If you are a new user to Linux, you probably can't wait to get to the Internet using your new operating system. As I promised from the beginning of this book Linux is not difficult, you just think it is difficult because you heard it was. The truth it is very simple.

Throughout my career I have been doing data recovery and when somebody asks me "is it difficult?" My answer is, "it is very simple man". I give no further explanation; I just know that I know how to do it. I want you to have one thing in your head, "no one appreciates your knowledge when it comes to computers". Everyone wants service for free; even the most outstanding politician wants service for free because they think that you have to do it for free.

Hey! What is this? You thought that computer professionals make a lot of money. Of course not! Unless you have a degree, know nothing and you are working for a big company or the government. If you don't believe me, how many of you technicians have talked to these big companies and have talked to support and encountered someone who does not know what he or she is talking about.

Well the purpose of this book is, to give you some understanding of how things are done in the real world, and gain some respect from those who think that they know too much, but know too little.

The dial up

Do you remember what I said about hardware compatibility? If you followed my advice from the beginning then the rest is piece of cake. If your modem is a real modem (hardware control flow) it is probably already installed and configured during installation. If the modem is supported, configuring the dial up will be quick and easy; it is done using Kppp or the networking through the control center. Let's start the Xwindow so you can look at what I am talking about.

```
[user1@localhost user1]$ startx
```

On your command line type **startx** and hit enter.

The graphical interface will start and will display a welcome wizard.

- Click on next.
- This wizard gives you an option for choosing a Desktop.
- On the drop down menu select KDE
- The KDE display also offers you a choice of Themes (look and feel).
 - a) default KDE
 - b) KDE Redmond
 - c) KDE Platinum
 - d) KDE Solaris
- Clicking on any of those options gives you a sample to the right panel
- Select one and click next

You can proceed with the wizard or just click cancel to get right to the desktop.

*Note: At the bottom of your desktop is the task bar; there are several icons, among them should be an icon for **control center (system configuration tool)**.*

On the very left side of your screen there is a big K. That is the start button, click on it to display the program menu.

Presenting the Control Center

Let's take a quick look at the control center so you can see what is available there for system administration.

1. On your task bar **click** on the **control center** icon (see fig. 2.1)
2. If the icon is not on the task bar, use the **KDE** Menu => Configuration => Mandrake Control center.
3. You are prompted for a password (enter the **root password**)



Fig. 2.1

Under this control center you can do anything, it is mainly for system administration.

There is an interesting icon in the control center (Hardware => Hardware List), very useful for hardware troubleshooting.

Click on the **hardware List** to view all hardware detected by your Linux system. The hardware list is very useful. It runs a detection process and returns a list of detected hardware. Clicking on any device on the list gives a description of the device on the **right panel**. Learn how to use this panel. It even gives a module name that makes the device work with your Linux operating system.

Configuring the connection (Dial UP)



You can accomplish the connection by clicking the **network & Internet icon** from the control center main menu

- Click on Network & Internet
- Click on connection
- You can create a profile or leave as default.
- Click on wizard
- Click on expert
- Click on next
- Select on normal modem connection.

Fig. 2.2

- Uncheck LAN connection if detected.
- Click on next
- Select **ttys#/com** port for the modem
- Click next
- Fill out the required info
 - a) Name
 - b) Phone number
 - c) Login ID
 - d) Password
- Click next
- Answer yes to connect to the internet
- Click next

Note: *This wizard will only be successful if you entered the correct **COM port**, and if your **modem is working properly**.*

The easiest way to configure a Dial up KPPP

If your connection did not work, quit the control center and follow these steps. You should use KPPP dial up tool instead of the control center, as it is faster and more efficient in configuring your dial up.

- Click on the start menu (big K)
- Click on Networking
- Click on Remote access
- Click on KPP (internet dial up tool)

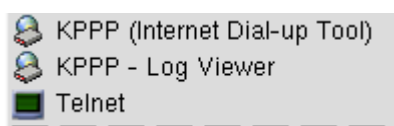


Fig. 2.3

- Click on Setup



Fig. 2.4

- Click on Device

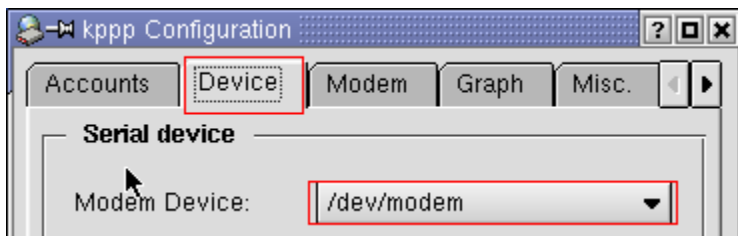


Fig. 2.5

Observe closely the **modem device** drop down menu might have **/dev/modem** as default. Click on the drop down arrow and you will see a list of **/dev/ttys**, these are the COM ports. **Com ports equivalent:**

/dev/stty0	=	com1
/dev/stty1	=	com2
/dev/stty2	=	com3
/dev/stty3	=	com4

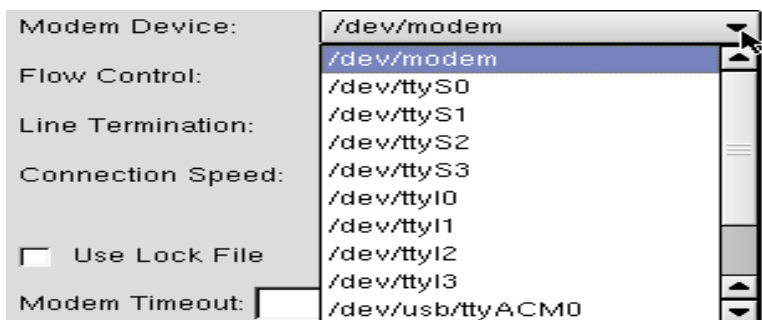


Fig. 2.6

External modems, most likely will be on com1 or com2. Whatever your case is, select the appropriate COM port for your modem and click OK.

Click on set up again.

- Click on modem



Fig. 2.7

- Click on Query Modem

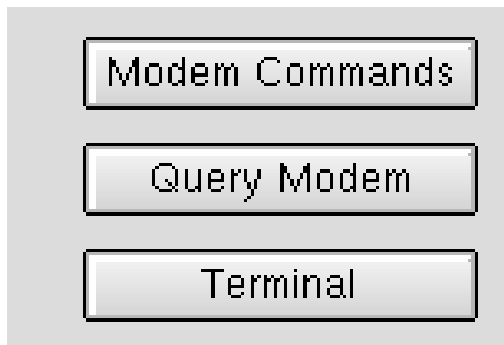


Fig. 2.8

If the COM port selected is correct, the query progress will display from 0% to 100% and will display the Modem Query Result window. Click close.

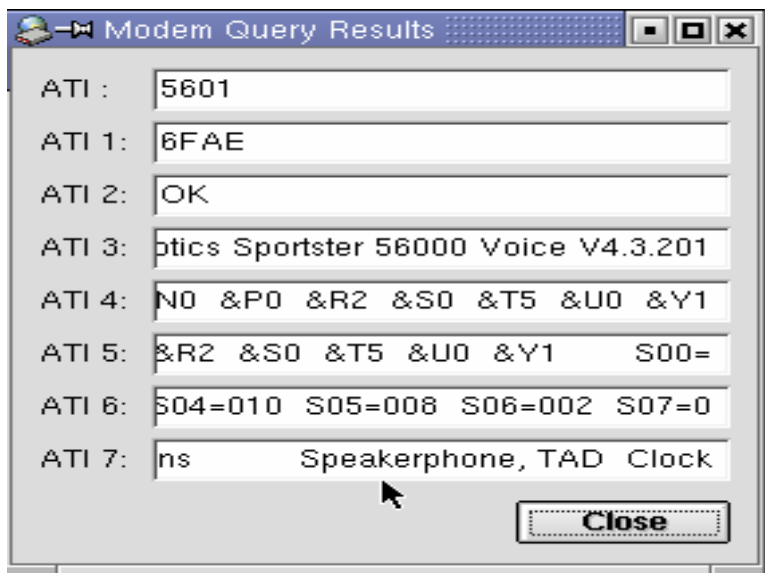


Fig. 2.9

If the COM port selected is incorrect, you will receive modem not found or can't open port. Try selecting different COM ports until you find the correct one. Test it by querying the modem. When your query is successful that means your modem is working properly. Figure 2.9 demonstrates a successful query result.

Next, **Setup the account given to you by your ISP** and try to make a connection.

- Click on Account
- Click on New
- Click on Dialog setup

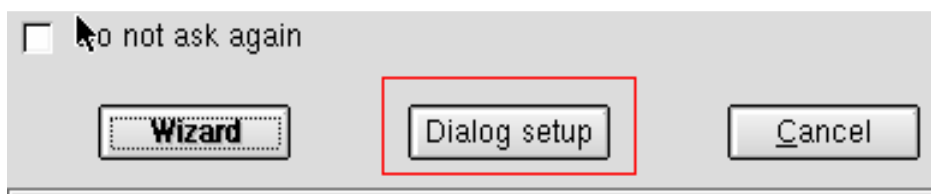


Fig. 2.10

- Type the connection name (**connection name is not the Login ID, fig. 2.10**)
- Click on Add to add a phone number (if you need a number to dial out include it as well)

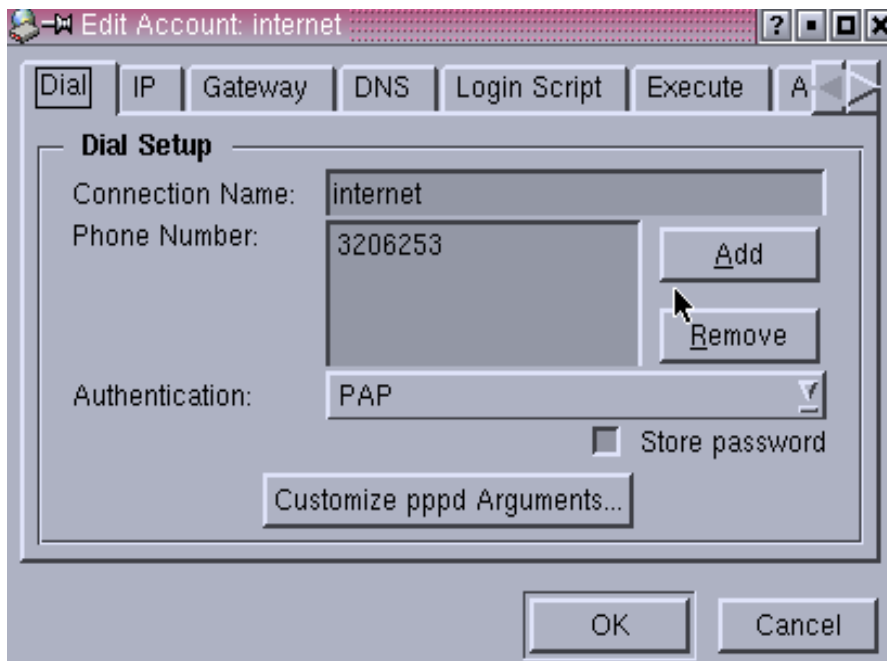


Fig. 2.11

- Enter the phone number of your ISP and click OK
- Select the box for Store password if you want the system to remember your password.
- Click OK
- Click Ok again
- Type your user name (Login ID) and password
- Click on connect

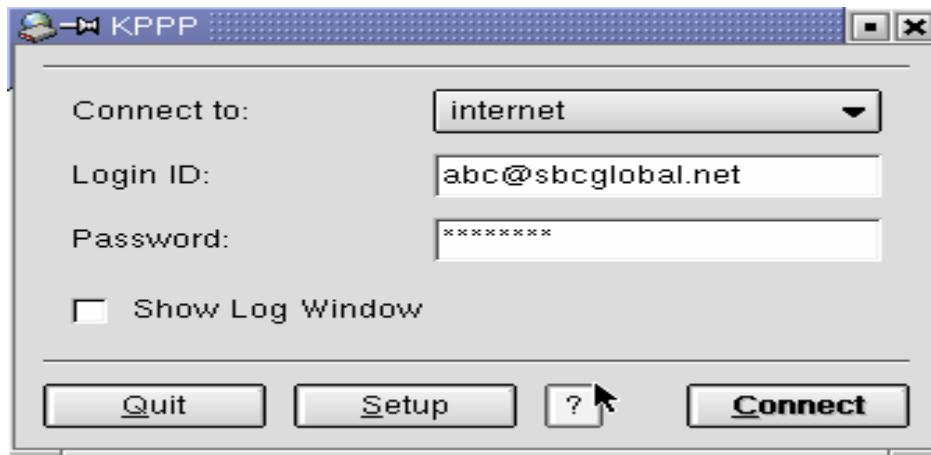


Fig. 2.12

Once you click on Connect, the modem should start Dialing. Congratulations you are on the Internet!

On the task bar, you should see a world icon that is the Konqueror web browser. To launch, click on it. Or find Mozilla on the Sub-menu.

- **Kstart =>Networking => www =>Mozilla.**



Fig. 2.13

To set your **home page** on Konqueror **click on setting**, scroll down to: **Configure Konqueror**. On **Home URL** type your favorite **Website Address** and click OK. Next time you open Konqueror it will take you to your home page, if not, just click home from your browser.

High Speed Internet

To start using high speed Internet access, first you have to make sure that the NIC (Network Interface Card) is up and active. There are several ways to verify if a net card is working or not.

Observe when the system is booting up, you will see the modules are being loaded.

```
Bringing up loopback .....OK
Bringing up interface eth0.....OK
Bringing up interface eth1.....OK
```

If you have more than one net card you should see them up at boot time. On special cases your net card fails to load because the driver that is being used is incorrect or the net card is incompatible with Linux. Let's assume that your net card is compatible with Linux, and for some reason you don't see it at boot time.

- First we have to login as a regular user
- Become a super user (**su**)

Linux comes with several utilities that help the user or system administrator to manipulate and configure the system. In some distributions comes with ntsysv, netconf, and linuxconf. Our particular Mandrake comes with: `netconf` and `linuxconf`. These are the two tools used to get to our network configuration.

Testing and Configuring the NIC

Execute **netconf** or **linuxconf** to get to the network configuration. The following example is demonstrated in text mode. Linuxconf as well as many other utilities can be used in both in graphical or text modes. When you encounter problems (lockups) in either mode, simply switch to the other.

```
[root@localhost user1]# linuxconf
```

Linuxconf is a very powerful utility (whether in text or graphical); it probably will become one of your favorite tools for system administration.

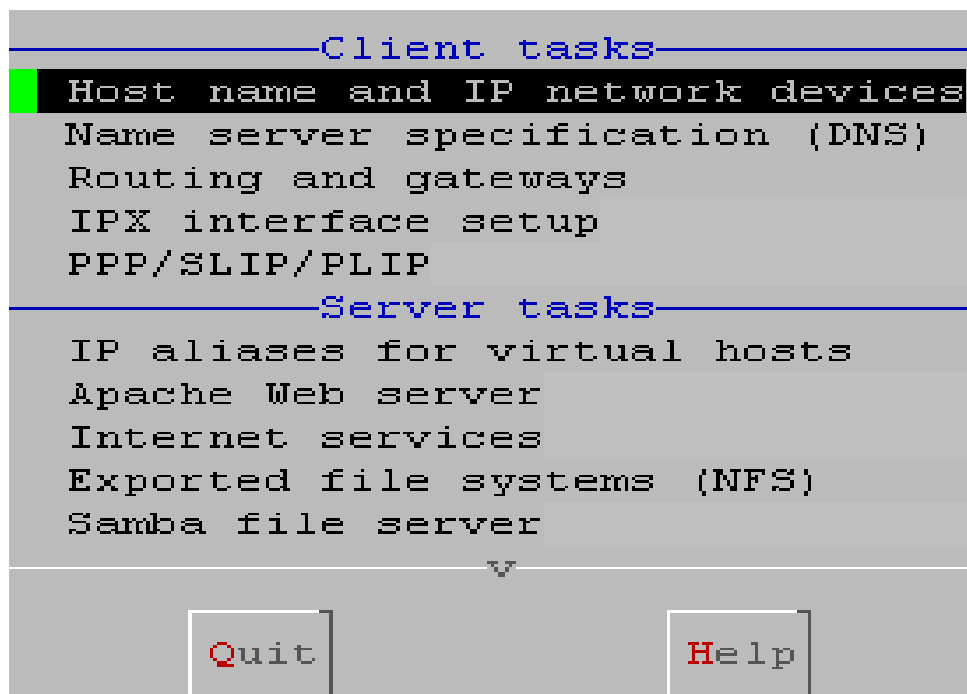


Fig. 2.14 *Linuxconf* executed under text mode.

When you get to the main screen of the network configuration, you have three subsets of options: **Client task**, **Server task** and **Misc**.

***** Use the Tab key to move between fields**

- From the client task select **Host name and IP network devices**.
- On the **Host name + domain type**: Type the name of your computer.

Example:

Server2.yourdomain.com

Server2 or server1 + yourdomain.com

Note. *Yourdomain.com* would be the name of your registered domain. If you do not have a register domain name, just call it *localdomain*.

- Under adaptor 1 [select enabled]
- For static IP, select **(X) Manual**, for dynamic, select **(x) dhcp**.

The following picture demonstrates a system with static IP, which I have configured to demonstrate how servers are configured to provide Internet services to the public. If you are going to use your Linux system only for a dynamic Internet connection, just set it to DHCP with no IP address.

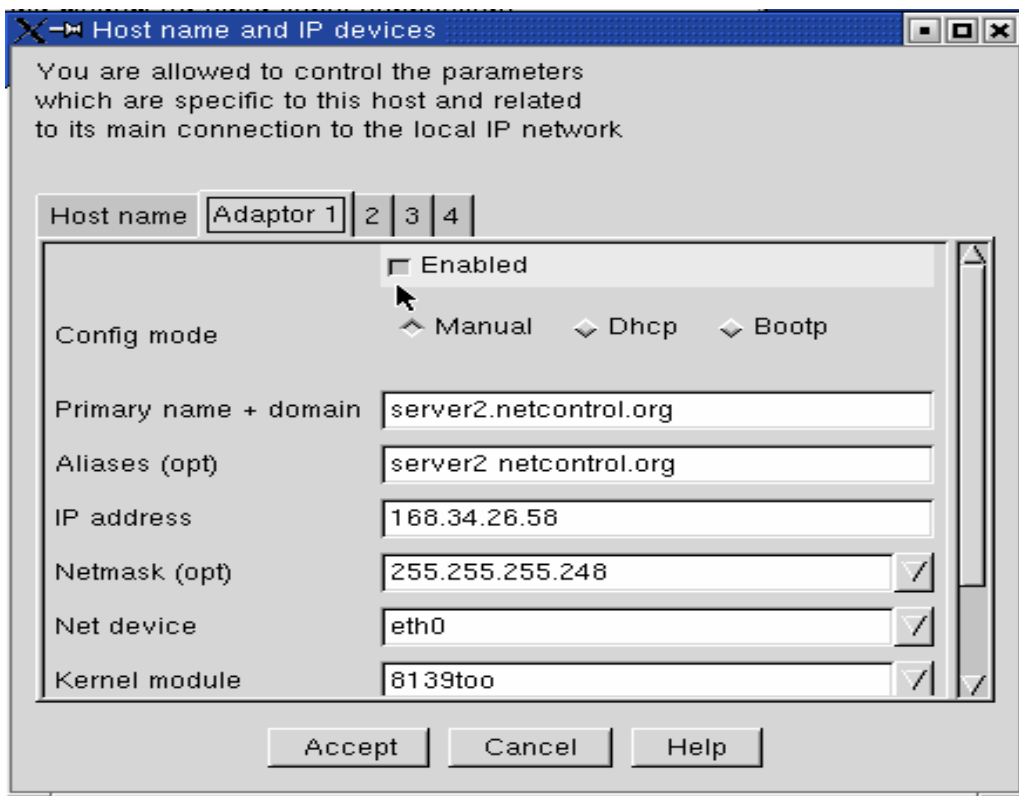


Fig. 2.15 (For u hackerz out there,☺) Note. That is not my real IP address. Blah...

The question is will your connection be dynamic or static?

Static means your ISP will assign you an IP address, which will be assigned permanently to your computer; that also means that if you are going to setup a web server, people will be able to get to your website. Because it is a static IP address it will never change unless for some reason your ISP decides to change it.

Dynamic IP addresses are numbers that are constantly changing every time you connect to the Internet. For example, when your modem dials your Internet provider it is automatically assigned an IP address. The next time you dial to the Internet it will be assigned the first available number.

If your connection is dynamic, enter any IP address for testing purposes (remember we are just testing the net card). The next step, I will show you how to setup your dynamic connection.

For static enter:

- **IP address**
- **Enter the subnet mask**
(Refer to chapter 8 IP Addresses Networks and Subnets)

The most important thing for your net card to be active is the driver (kernel module), if you don't know what the appropriate driver is, the net card will not work.

- **The net device: is the numerical order of your NIC (network interface card)**
Ex. NIC #1 = eth0 NIC #2 = eth1 etc.
- **Then the Kernel module: (8139too)[this is what makes your net card function]**

Once you have all the information you need:

- **Select accept.**
- **Select Quit**
- **Finally select Do it**

Note: *You may be prompted to change now or reboot. **Select to reboot.***

Reboot your system and you should see the Bringing up interface eth0 to go OK.

That is how you configure a net card. When you don't know which driver to use, there are two choices. You do it the hard way, spend some time on the Internet researching everything about your net card or do it the easy way. You probably already guessed where to go from here. If you did, congratulations...you are learning.

If you are lost:

```
[user1@localhost user1]$startx
```

Type **startx** on your command line, hit **enter**. Go back to the **control center**

- Click on **hardware**
- Click on **hardware list**
- From the list, under sub-tree Ethernecard Click on your card name
- On the information panel to your right find **Module:**
- Write down the module name
- Exit the **control center**
- Load **netconf** or **linuxconf** from your console as **root** or **super user**
- Write the **module** name you just got from the control center into net device **kernel module. (make sure adaptor1 is enabled)**

Accept the new info, Accept, Quit and Do it. Reboot your system and now you should see the interface up OK.

To verify that the net card is working, on your command line, ping the IP address.

Example:

```
[agustin@server2 agustin]$ping 168.34.26.58
```

This command should give you a response of **64 bytes from ... in milliseconds**. If you get a timeout error, something is wrong, go over the configuration again.

DSL Modems and Cable modems

If you are new to Linux, you probably always wondered how to use your DSL or Cable modem to surf at high speed and it may probably be just the right time; if that is the case congratulations you just got the perfect book that will help you connect your internet connection successfully.

Plain modems (DSL or Cable) are usually connected via PPPoE or DHCP, normally your ISP sends you a modem and a CD with the required application to connect a windows system, but in Linux we don't use those CDs instead we use build in application that allows us to quickly and easily connect a Linux system to the internet.

To make it much easier to understand, it is most likely that a DSL provider will use a PPPoE protocol and a cable company will use DHCP, but be aware that they may use either of these protocols. This is usually the case in plain modems for residential service.

Note: Get as much information about your internet connection as possible to make it easier when you get to the actual configuration. Be informed that I use the word Plain modems, which means regular modems no built in routers.

Configuring the Internet connection with a Plain DSL modem

Make sure you have connected everything Ethernet cable, power adapter, the phone line, filters, or coax for cable (for cable modem). When ready, to start your configurations launch the Mandrake Control Center

Before you start this wizard you should set your NIC to **DHCP**, which will make it easy to go through the following settings.

- Click on Network and Internet.
- Click on DrakConnect or Connection (Depending on your Mandrake version)

Once you click on this icon, a wizard will start. See the following picture.

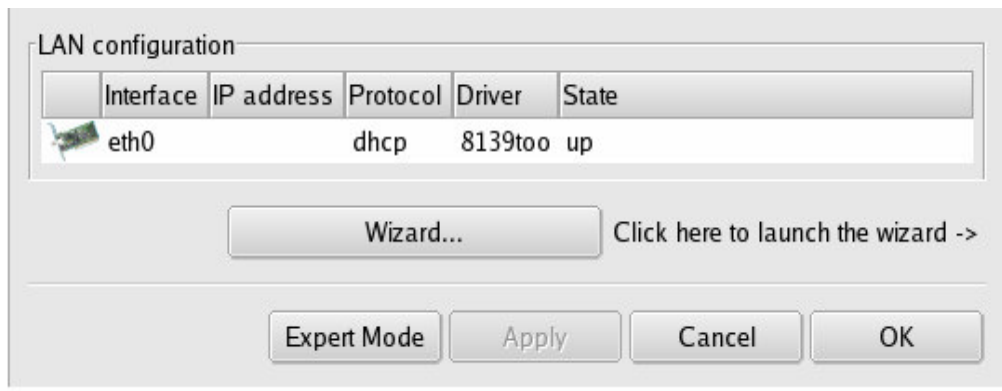


Fig. 2.16

On the first screen of the wizard, you should see the net card status "UP" and interface eth0.

- Click on wizard to continue

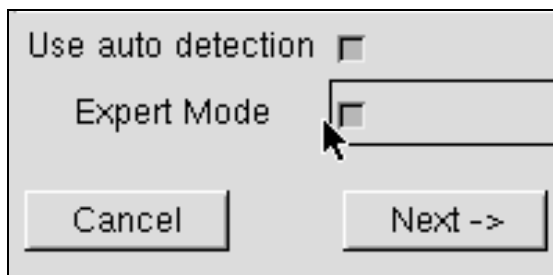


Fig. 2.17

- Click on expert
- Click on Next to Continue

The next step is very important; select your connection type.

Note. If you are using static IP for your DSL, select LAN instead of ADSL (for modem-router, see the section routers).

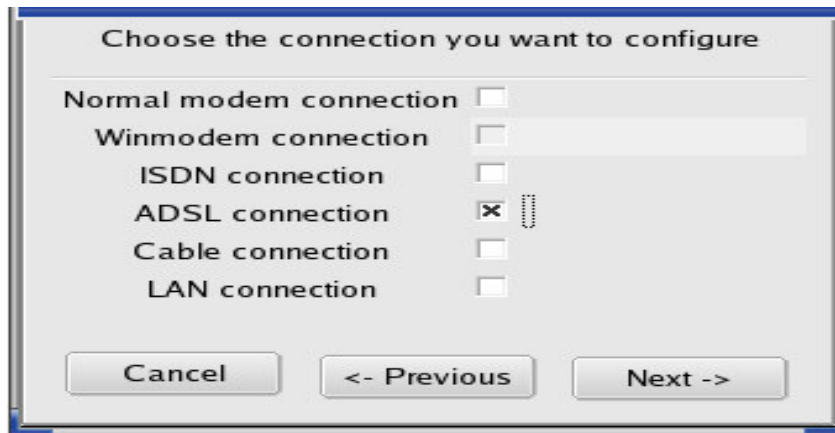


Fig. 2.18

For example:

- If you are using any XDSL connection, you should select ADSL on this menu.

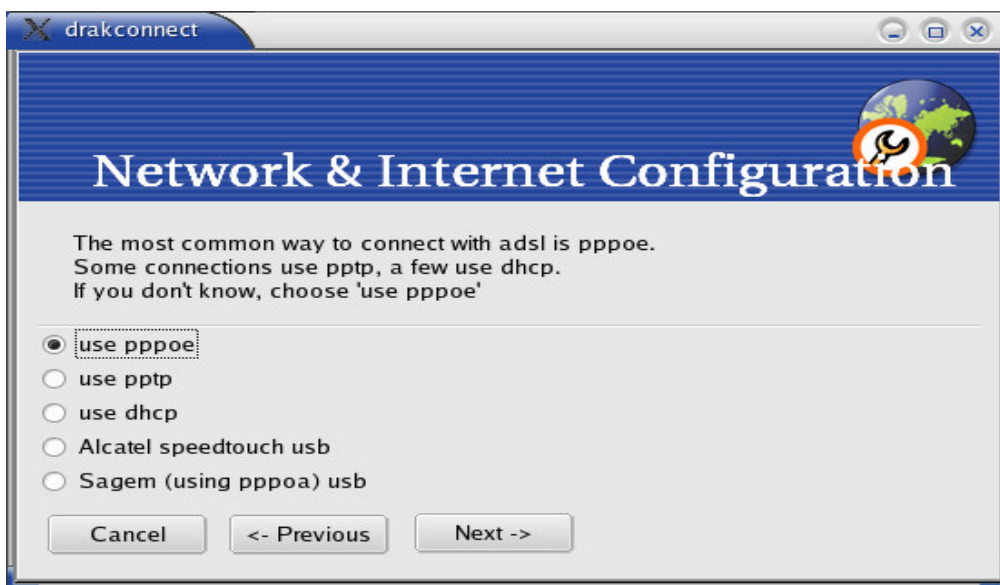
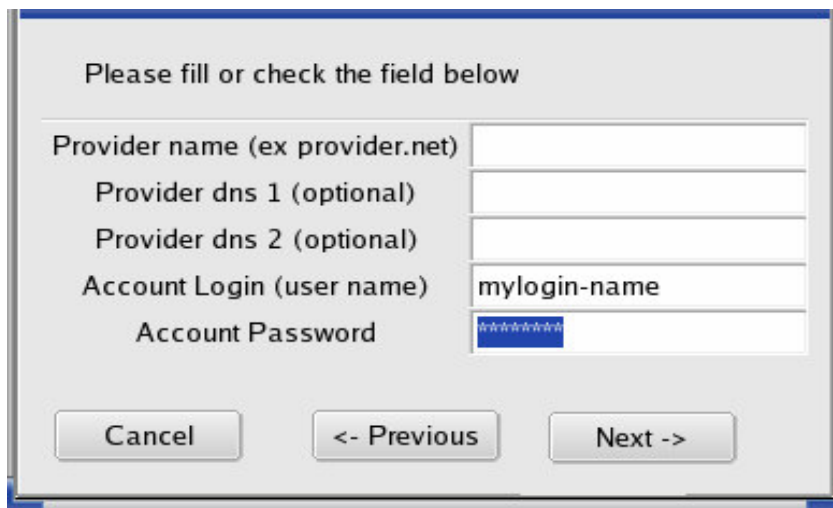


Fig. 2.19

For DSL select the appropriate protocol, PPPoE is very often used but you should verify this with your ISP.

If you are using PPPoE, you should have all the information required such as the DNS provided by your ISP, but mainly your account user name (account login) and password.



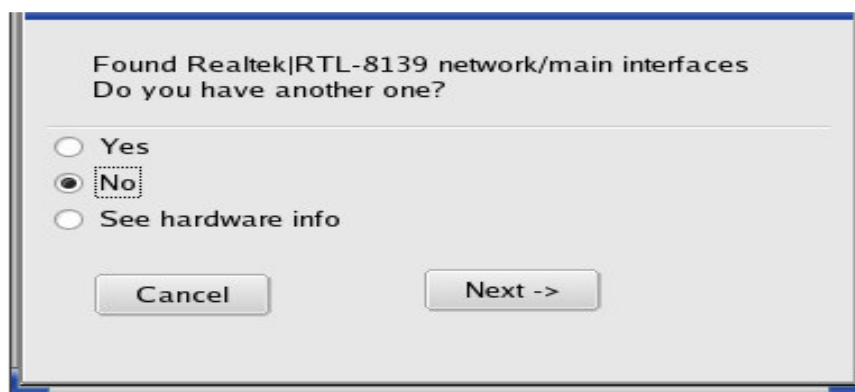
Please fill or check the field below

Provider name (ex provider.net)	
Provider dns 1 (optional)	
Provider dns 2 (optional)	
Account Login (user name)	mylogin-name
Account Password	*****

Fig. 2.20

- Click on Next

Once you click on next, your network interface card should be detected. My recommendation is whenever you try to connect a computer to a network; you should always install only one NIC in your system, so when you run a wizard like this you don't get confused on the installation. If you need a second net card, you can always add it later.



Found Realtek|RTL-8139 network/main interfaces
Do you have another one?

☐ Yes
☒ No
☐ See hardware info

Fig. 2.21

- Click on next

You are prompted with a question; do you want to start the connection at boot time? The answer is **Yes**.

- Click on Next

Next the network needs to be restarted; do you want to restart it now? Again the answer is **Yes**.

- Select yes and click Next

The next question is -do you want to connect to the internet now? The answer to this question does not really matter, but you should answer **No**.

- Click next

The wizard is completed

- Click Finish

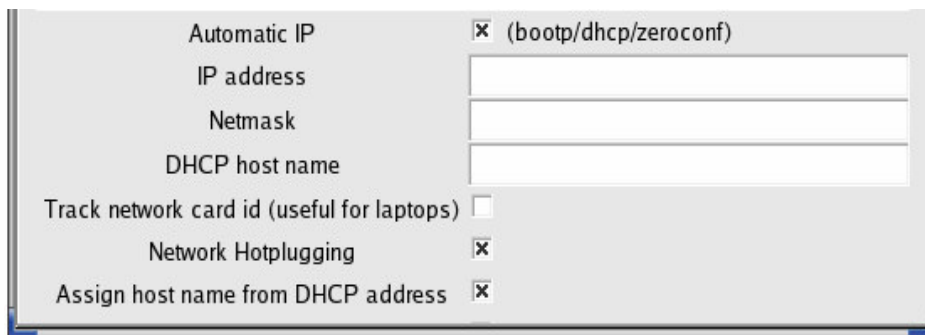
You should apply all changes, exit the control center and restart your computer. When your system fully restarted, open the web browser to test your connection and enjoy your internet connection.

Connecting DSL as DHCP

If your DSL Connection is via DHCP, refer to figure 2.19, protocol selection. When selecting DHCP you may be prompted to insert one of the distributions CD's, probably Disk1 for additional software installation (DHCP client).

Insert the CD and click OK to proceed with the software installation. After all the packages have been installed, again the net card is probed and asks you, do you have another interface? Answer yes or no. I assume no, see figure 2.21 and click next.

Depending on whether you have another NIC or not, the next screen will be the following requiring the necessary information for the connection.



The screenshot shows a network configuration window with the following fields and options:

- Automatic IP:** ☒ (bootp/dhcp/zeroconf)
- IP address:**
- Netmask:**
- DHCP host name:**
- Track network card id (useful for laptops):** ☐
- Network Hotplugging:** ☒
- Assign host name from DHCP address:** ☒

Fig. 2.22

Note. *Maximize the screen to see the buttons at the bottom.*

Because this is a DHCP connection, you do not need to enter any IP address, just make sure Automatic IP check box is selected. The ISP's server provides the IP address dynamically.

- Click next to continue.



The screenshot shows a Zeroconf host name configuration window with the following fields and buttons:

- Instruction:** Enter a Zeroconf host name without any dot if you don't want to use the default host name.
- Zeroconf Host name:**
- Host name:**
- Buttons:** Cancel, <- Previous, Next ->

Fig. 2.23

The physical host name is automatically detected; you do not need to enter a Zeroconf host name here.

- Click next to continue



Fig. 2.24

This is a direct connection, there are no Proxies just click next.

- Next the network needs to be restarted, select **yes** and
- Click next.

Once the network is restarted, you will receive a congratulation screen.

- Click finish
- Click on Apply or Ok
- Exit the control center
- Restart the system

After restarting the system open the web browser (Mozilla or Konqueror) and enjoy your high-speed connection.

Setting up a Plain Cable Modem (DOCSIS)

Data-over-cable Service Interface Specification

Setting up a cable modem is as easy as setting up a DSL modem. Again, plain modem no router. Many cable modems are installed using DHCP protocol. In other words, all the information that is required is gathered dynamically from the ISP's server. You will be surprised how many providers use DHCP (no password required at all) and the installation is quite simple.

To start your installation, get to the control center, start the wizard in expert mode and when you get to the connection type, refer to figure 2.18. Select cable modem.

- From figure 2.18, make sure cable connection is selected and click next.
- Your connection should be dhcp-client

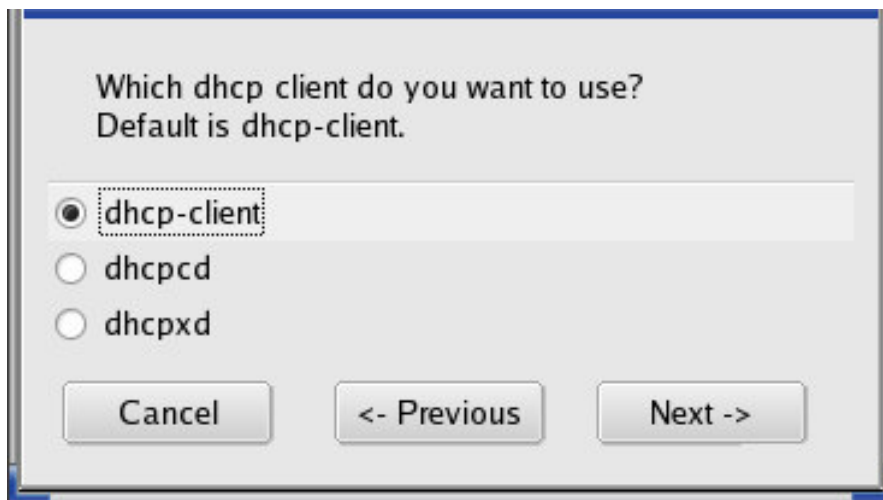


Fig. 2.25

The net card is probed the same as for the DSL connection. It will ask you if you have another one, select yes or no and click next.

No manual information is required, see fig. 2.22, and maximize the window to view the buttons. Make sure Automatic IP check box is selected **[x] (boot/dhcp/zeroconf)**

- click next

On the next screen the Host Name is automatically detected. The zeroconf host name field is not required, see figure 2.23.

- Click next
- No proxy server is required (see figure 2.24) (*proxies will be discussed later*)
- Click next
- The network needs to be restarted, select yes and click next.

You receive the congratulations screen, the network has been restarted

- Click finish
- Click Ok to apply the configuration
- Exit the control center
- Restart the computer

After restarting the computer, open the web browser and you should be able to browse the internet, congratulations.

Connecting an ISDN

If you are still using ISDN, you will find this helpful... ISDN used to be the fastest connection, compared to regular analog modems. Its functionality is still the same (Very expensive by the way). That is the reasons not a lot of users have them. But of course ISDN was an alternative to T1, T2 and T3. Today ISDN is being replaced by DSL which is actually more cost effective. DSL is still slow compared to T lines. But I am very sure that with DSL you can run any server. Trust me I already run several servers on the same DSL line and everything runs smooth. You can always upgrade to T lines if you think you have the need or money.

The ISDN modems have to be operational just like the regular modem in order to make a successful connection. If you have noticed earlier during the wizard, you had the option to select your connection type. Well that's exactly the way to do it.

Get back to the control center and run the wizard.

- Click on Network & internet
- Click on connection
- Click on wizard
- Click on expert
- This time click on ISDN

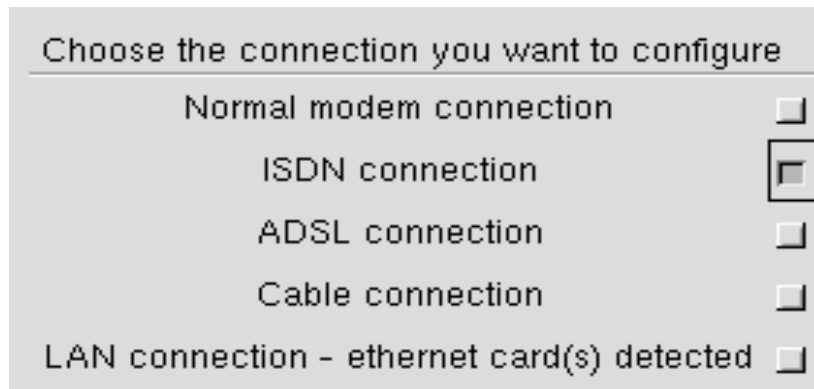


Fig. 2.26

- Click on Next

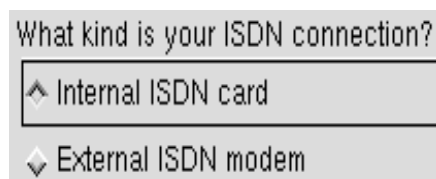
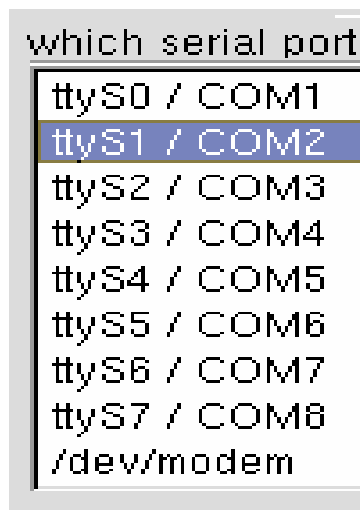


Fig. 2.27

pay attention when you select your modem type, this decision may cause your success or failure. Remember external modems usually are assigned to COM1 and COM2 respectively.



Once you have selected your modem type, you have to select the appropriate COM port.

Fig. 2.28

Look at figure 2.28 it describes all the COM ports available; if the modem is internal it could be connected to any of the ports from com3 to com8.

In this scenario the modem is connected to com2, which is an external modem.

An ISDN modem is a dial up modem, and it requires all the necessary information to accomplish the authentication. Fill out all the information on panel fig. 2.29.

Dialup options	
Connection name	<input type="text"/>
Phone number	<input type="text"/>
Login ID	<input type="text"/>
Password	<input type="password"/>
Authentication	PAP <input type="button" value="v"/>
Domain name	<input type="text"/>
First DNS Server (optional)	<input type="text"/>
Second DNS Server (optional)	<input type="text"/>

Fig. 2.29

An ISDN connection is assigned a dynamic IP address. That is the reason DNS is optional here, because everything is DHCP (there may be special occasions when ISDN is using static IP). Fill out the necessary information and click next. You will be prompted to finish and apply the setting. After applying the setting, you should be able to connect. Enjoy!

Configuring Your High Speed Internet Using Routers and Modem/Routers

The router

A router is the hardware that interconnects your computer to the Internet. It is configurable in order to route packets to the correct destination such as one network to another.

Many Internet providers offer DSL connection for residential, and most providers include a modem with their packages. These modems are plain digital signal transceivers (transmit and receive) on your telephone line. Remember your telephone line is analog and in order to achieve a high-speed data transmission a modem is used to transmit and receive digital signal from the host (Telco equipment "router") and route the data to the nearest Internet server.

When you subscribe to a DSL provider, you basically first go through the telephone company to be approved for DSL (Digital Service Line). If the phone company has the right equipment already installed in your area, then it is said that you are qualified for DSL.

The regular DSL modem that is sent to you by your provider, usually is software driven (requires software to dial and login). Most residential DSL are dynamic connections; that is the reason it uses software to communicate and negotiate with the server and obtain an IP address temporarily. Make note that those modems only work with only one computer.

A router can be easily attached to those modems to expand the network to connect as many computers as you want. Routers are easy to configure for dynamic or static connections. Consult before you buy a router read on the package as it usually tells some specs about the router. The documentation tells how to access the configuration. Depending on the brand names and models a lot of them out there are configured via a web browser. Others are configured through a console terminal. The advantages and disadvantages of each other will depend on issues such as integrated firewall and prices.

Visit www.linksys.com www.smc.com and www.netgear.com read all the documentation for any router there so you can make better decisions when you buy. These websites have mostly web based programmed routers. Be ready before you go through the following configuration. Have all the information you need on hand.

So how do you program a router?

All routers are different, but many are configured the same way. When you don't know a piece of equipment read about it... the more information you gather the more professional you become when dealing with the product.

For example if your account is a dynamic connection; you may not even have to do anything but connect, and it is ready to go. Why? Some routers are pre-configured as DHCP from the manufacturer and generally obtain the information automatically from the ISP.

When connecting your router, make sure you connect everything:

- Power adapter
- Ethernet cable (cat 5), from the router to the PC
- The telephone cord from the wall jack

I have seen a lot of people claiming that their equipment doesn't work; I swear it helps a little bit if you plug in the power.

The Router's Front Panel

Some routers are very descriptive. The front panel, have LED's that tell you what devices are connected and on.




Label	Activity	Description
Power 	ON OFF	Power is supplied to the router Power is not supplied to the router
Test 	ON OFF	The router is initializing The system is ready and running
Internet WAN 	ON Blink	The internet port has detected a connection with the attached device. Data is being transmitted or received by the internet port (WAN)
LAN Local Area Network	ON(Green) Blink(Green) ON(Amber) Blink(Amber) OFF	The local port has detected a link with a 100 Mbps dev Data is being transmitted or received at 100 Mbps Port has detected a link with a 10 Mbps device Data is being transmitted at 10 Mbps No link is detected at this port

Table 2.1

The Router's Rear Panel

The rear panel of the router contains the port connections for your computers.

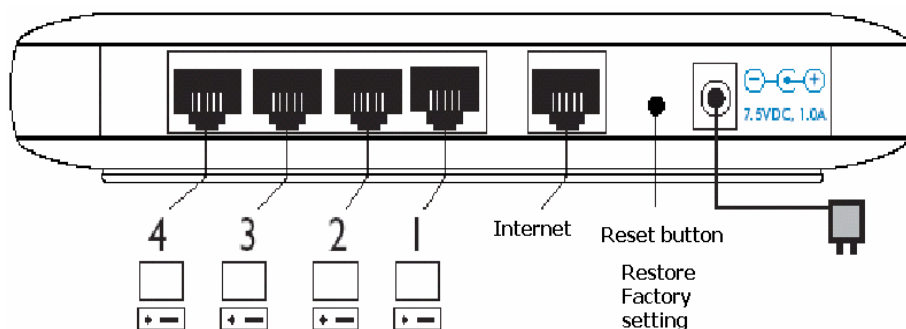


Fig. 2.30

For some routers in the rear panel it has a reset button. But note that some routers do not have a reset button.

Make sure that everything is connected properly. There is one port on the router called WAN or Internet, which is the port for the Internet. (That is where the cable or DSL modem goes). Refer to fig. 2.30 the ports 1-4 are your computers.

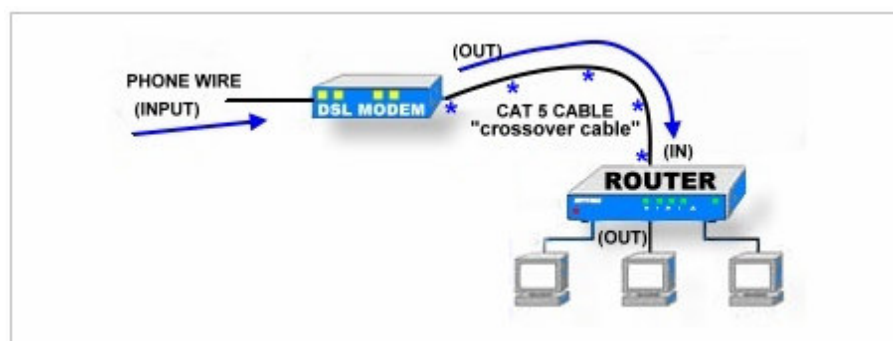


Fig. 2.31 This is how the connection looks with a plain modem connected to a router.

Note. You can connect any local port of the router to the Uplink port of an Ethernet hub or switch using standard category 5 Ethernet cable. You may also connect any Local port of your router to any normal port of an Ethernet hub or switch using a crossover Ethernet cable.

Figure 2.31 demonstrates two devices being used (modem and router). This picture could possibly represent a residential connection (Single user account). Much of the configuration information is dynamically assigned.

The router is used in order to share the Internet connection with other computers in your LAN. When the router's WAN port is connected to the DSL modem, the routers appear to be a single PC to the ISP. It then masquerades as a single PC to access the Internet through the DSL modem allowing the rest of the internal Network to gain access to the Internet. This method is called NAT (Network Address Translation) occurring within the router.

Login Protocols

Some ISPs require you to login. You must enter a login name and password in order to connect to their Internet server. To accomplish this task a protocol is used to carry out the transaction. The most common protocol uses PPP over Ethernet (PPPoE).

When you configure the router, you will enter your login name and password in the configuration menu. After the router is configured, the router will perform the typing of user-name and password automatically whenever needed.

Account information

When the account information is not assigned dynamically, your ISP should give you the following information.

- An IP address and Subnet mask
- A gateway IP (the Address of your ISP's router)
- Domain name servers (DNS)
- Host name and domain suffix

Ready for the configuration

At this point your net card must be set as dynamic **(x) DHCP**. Make sure your net card is [x]**enabled**. Save the settings and restart the computer. Refer to figure. 2.15

Accessing the Router's Web Configuration Manager

Make sure that both devices modem and router are on. If you just turned it on give it a minute to initialize. Next, find in the router's manual an IP address to type in the web browser.

Example (192.168.1.1)

- Open your browser, it is all right if you receive an error at this point
- Enter the IP address in the browser and press enter.



Fig. 2.32

- A login window opens as show in Figure 2.33
- Enter the administrator's username and password found in your manual.

Once your user name and password is authenticated, you will be on the configuration page. If this is the first time you run this configuration, a wizard may start automatically.



Fig. 2.33

If you never configured a router before, I suggest you make note of the default settings or print it if you can.

Taking notes on this configuration is a good method and learning habit. You will have a good reference material whenever you need it. Check (Fig.2.34) it is the basic configuration page, and asks you if your connection requires a login.

Basic Settings

Does Your Internet Connection Require A Login?

☐ Yes

☒ No

Account Name (If Required)

Domain Name (If Required)

Internet IP Address

☒ Get Dynamically From ISP

☐ Use Static IP Address

IP Address

IP Subnet Mask

Gateway IP Address

Domain Name Server (DNS) Address

☒ Get Automatically From ISP

☐ Use These DNS Servers

Primary DNS

Secondary DNS

Router's MAC Address

☒ Use Default Address

☐ Use This Computer's MAC

☐ Use This MAC Address

Help

The RP614 Settings pages allow you to configure, upgrade and check the status of your NETGEAR Cable/DSL Web Safe Router.

Click an item in the leftmost column. The current settings or information for that area appear in the center column.

Helpful information related to the selected Settings page appears in this column. If you are using Internet Explorer, you may click an item in the center column to jump directly to the related help section; otherwise, scroll down until you reach it.

Basic Settings Help

Note: If you are setting up the router for the first time, the default settings may work for you with no changes.

Does your Internet connection require a login?

Select this option based on the type of account you have with your ISP. If you need to enter login information every time you connect to the Internet or you have a PPPoE account with your ISP, select **Yes**. Otherwise, select **No**.

Note: If you have installed PPP software such as WinPoET (from Earthlink) or Enternet (from PacBell), then you have PPPoE. Select **Yes**.

Login

Fig. 2.34 Browser based configuration Main menu

Configuring the connection with Login RFC 2516 PPPoE

PPPoE

Account Name

Domain Name

Login

Password

Idle Timeout

Domain Name Server (DNS) Address

☒ Get automatically from ISP

☐ Use these DNS servers

Primary DNS

Secondary DNS

Fig. 2.35

If you are in wizard mode, and you answered **yes**, it requires a login. It will redirect you to a page to enter the required information. If it doesn't redirect you, check under the Setup option. There might be a way to get to the page to enter the information. Enter your account name (may also called Host Name)

Enter the domain name; this is needed to access services such as mail or news servers. If you leave the domain blank the router will attempt to get this information automatically from the ISP

- Enter the login name and password provided by your ISP

Domain name server (DNS), Get it automatically should be fine. Only if the ISP does not transmit it to the router during login; then enter it manually.

- Click on Apply
- Router's Mac Address: This is used on the Internet port, some ISP's will record it and it will be served for them as a unique address to accept traffic from. (Don't worry; I never had a problem with it. Just leave it as default).
- Click on Apply.

Click on the test button to launch the browser. It will most likely take you to the manufacturer's web site. You can also test this by exiting the router's configuration page and re-open the browser and enter any domain. If you get to the requested page then you have it successfully configured.

Note. Some routers require you to save and reboot for the changes to take effect. Read your manual it should have all the information you need.

WAN IP Address: Dynamic IP Account

Again if you are configuring this with the wizard, you should see the information as in fig. 2.36

Setup Wizard

System Can Now Detect The Connection Type Of WAN Port, Or You Can Configure It By Yourself.

Do You Want System To Detect The Connection Type?

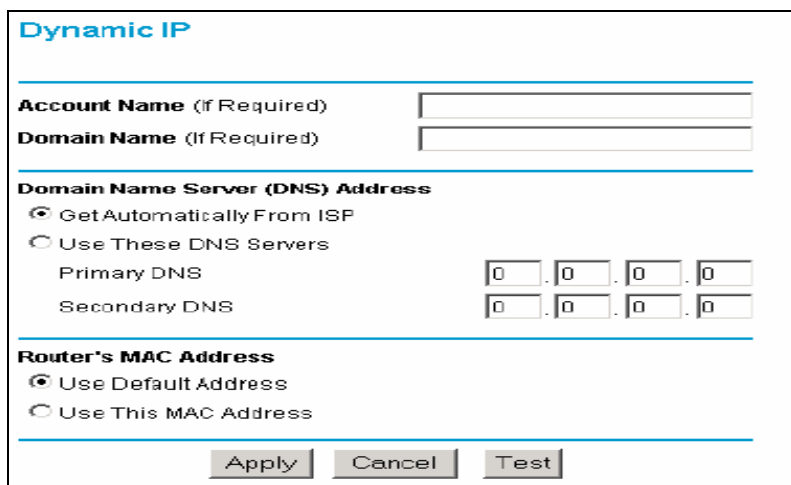
☒ Yes.

☐ No. I Want To Configure By Myself.

Next

Fig. 2.36

The wizard will instruct the router to determine the connection type if you answer **yes** to the question. However if you are doing this manually, you will still get to the following option. Enter all the required information.



Dynamic IP

Account Name (If Required)

Domain Name (If Required)

Domain Name Server (DNS) Address

☒ Get Automatically From ISP

☐ Use These DNS Servers

Primary DNS

Secondary DNS

Router's MAC Address

☒ Use Default Address

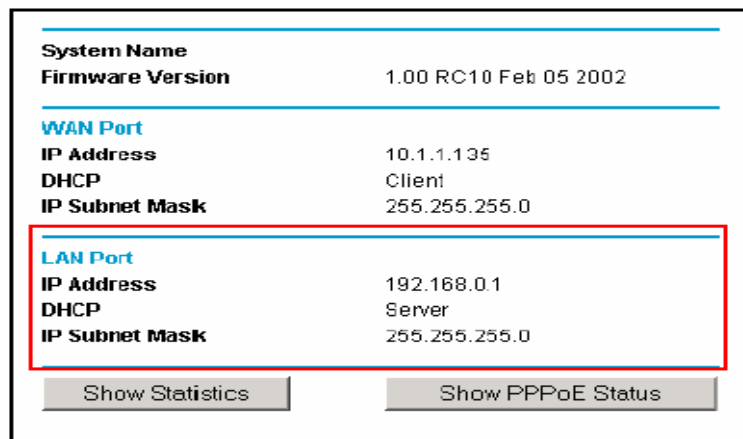
☐ Use This MAC Address

Fig. 2.37

For a Dynamic configuration enter the following:

- Enter the account name
- Enter the Domain name, necessary to access the ISP's services such as mail. If you leave this option blank, the router will attempt to obtain it from the ISP automatically. If you are having problem getting your emails, this field must be entered manually.
- Domain Name Server (DNS) you will assign this only if your ISP is not transmitting it automatically. Remember this is Dynamic so you should get it automatically.
- Mac Address: Leave as default.
- Click on Apply.

Test your connection



System Name

Firmware Version 1.00 RC10 Feb 05 2002

WAN Port

IP Address 10.1.1.135

DHCP Client

IP Subnet Mask 255.255.255.0

LAN Port

IP Address 192.168.0.1

DHCP Server

IP Subnet Mask 255.255.255.0

Fig. 2.38

On the LAN IP, it may be already pre-configured with a range of IP addresses. You can change these settings according to your needs.

Look at figure 2.38, it shows the current status of the router assigning IP addresses to the clients in the LAN. It is running as a DHCP Server, the subnet being used here will assign up to 254 hosts in the local area network. You can change the LAN IP addresses to assign a range of IP address that you require.

Commercial Configuration

On occasion the ISP will send a modem/router (combo). This type of equipment does not require a separate modem for the connection. It is unusual to get one of this equipment unless you are running a business. It may also depend on your account such as a package of static IP's etc.

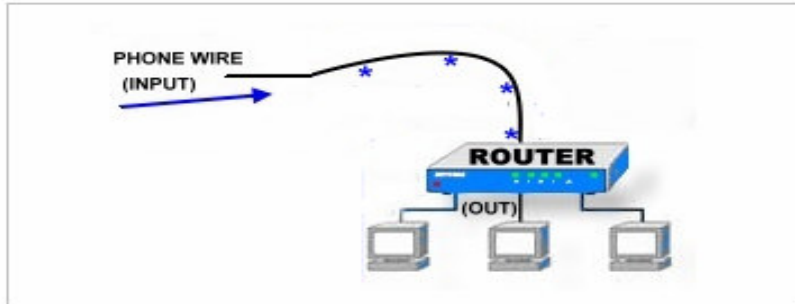


Fig. 2.39

Figure 2.39 basically represents combo equipment. This Router is configured exactly the same way as we already did for our last two connections.

WAN IP: Static Address Configuration

This settings is much easier to configure manually, all you have to do is get to the Static configuration page. The ISP should have sent you all the information required for the setup, in this case your IP Addresses. See the following table.

Your Router Side		Your Network Side	
Router IP	168.34.26.56	1 st IP	168.34.26.58
Gateway	168.34.26.57	2 nd IP	168.34.26.59
Subnet mask	255.255.255.248	3 rd IP	168.34.26.60
ISP's DNS	209.244.0.3	4 th IP	168.34.26.61
ISP's DNS	209.244.0.4	5 th IP	168.34.26.62
		Subnet mask	255.255.255.248

Table 2.2 This table shows a typical configuration sent by your ISP, an account with 5 static IP addresses

Figure 2.40 shows all entered IP addresses required for the connection (router side).

Fixed IP

Internet IP Address

IP Address

168342656

IP Subnet Mask

255255255248

Gateway IP Address

168342657

Domain Name Server (DNS) Address

Primary DNS

20924403

Secondary DNS

20924404

Apply

Cancel

Test

Fig. 2.40

- **Enter the router's IP address here.**
- **Enter the subnet mask**
- **Enter the Gateway**
- **Enter the DNS**

This router now has all the necessary information to connect to the Internet. According to Table 2.2, you have 5 static IP's. The range of the IP address from table 2.2 then would go into the Local Area Network (LAN) IP Setup, see fig 2.38. When you enter the range of your public IP's in the LAN IP section, then you no longer can assign 254 hosts, but the 5 IP's controlled by the subnet mask 255.255.255.248.

At this point your router has 5 public static IP's, which means that if you configure 5 computers with this IP addresses each computer could be a server over the internet.

You could also add an additional router to any of these IP addresses with a hub or switch to serve an internal local area network, or use any computer connected to any of these IP addresses and convert it into a Proxy server to assign an internal subnet which will provide Internet access to all the clients in the Local area network.

Troubleshooting

If for some reason something goes wrong, don't panic.

- Try to re-enter the IP address to get to the configuration page again
- If it doesn't work, configure the network properties with any IP address in the range designated by the manual
- For example, if the factory-default IP for the configuration is: 192.168.1.1, but now it doesn't work. Set a static IP in the network properties from 192.168.1.1 to 192.168.1.254, any value within this range may work.
- Try rebooting the system.
- If the router has an option for reset, use it.
- If nothing works call tech support directly (the router's manufacturer)

Connecting Linux to the router

Now that we know the router is working properly; we can go ahead and configure our Linux box. You will be surprised how easy it is to configure your connection.

Once your net card is working properly, the wizard from the control center becomes very handy. At this point you should assign the appropriate IP address to the Net card in your Linux box see Figure 2.15 and also make sure you declared the public IP range in the LAN side in the router.

Because my system is going to be running a web server, in the following configuration I already assigned a public static IP, just as it shows in Figure 2.15, by the time I will run the wizard it will pick the IP address from the NIC card.

Let's go back to the control center:



Fig. 2.41

Click on **connection** to start the wizard. You probably already noticed that this wizard could be used for all your network connectivity.

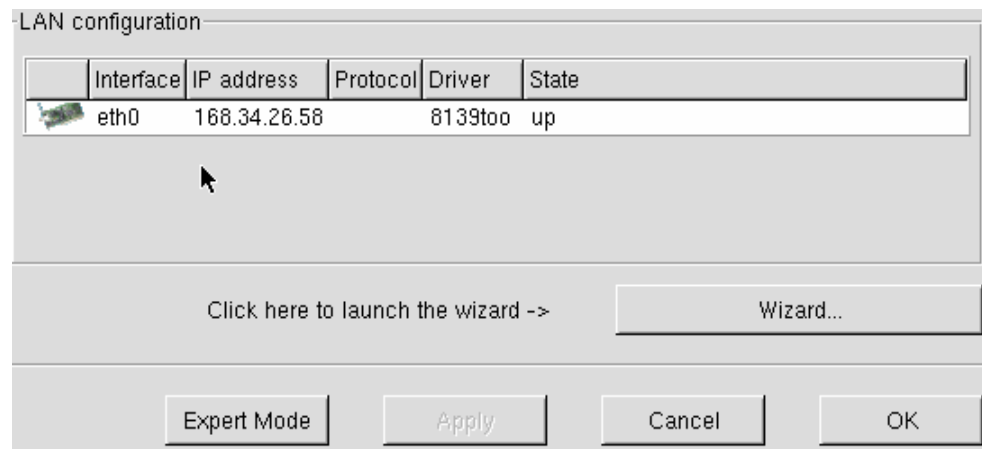


Fig. 2.42

Observe Figure 2.42 carefully; the IP address was detected automatically when I clicked on connection. The reason it was able to pick up this IP address is because the net card is active and functional. As a matter of fact look at the picture on the status (**state**) it says UP.

You may have the correct IP already if you entered one during your net card activation or during the installation process. To continue with our Internet configuration click on **Wizard**. You will see a welcome to the Network configuration wizard.

We are about to configure your internet/network connection...

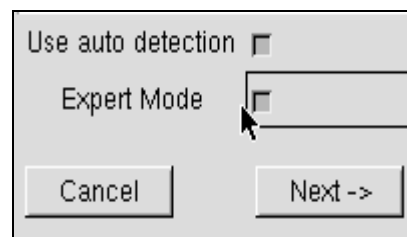


Fig. 1.43

- **Click on Expert**
- **Then click Next**

You will then be presented with several options:

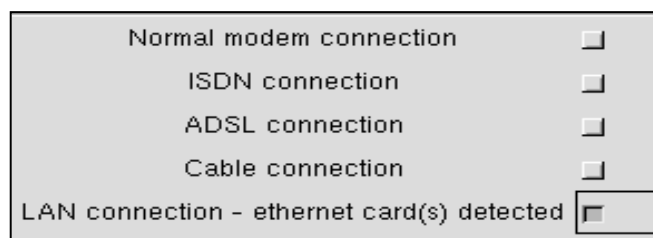


Fig. 2.44

During this process, you may be prompted for additional software installation. Insert the appropriate CD and Click OK.

When connecting your Linux box to the internet using a router, you will have to select the LAN option as shown in fig. 2.44



Fig. 2.45

- Click Next
- The wizard Finds a Net card

Answer appropriately and Click Next.

According to the router; it knows that it is controlling an internal network, either Dynamic or Static IP's for the Clients' side (your computers) as you declared it in the internal network range with its respective subnet.

As in the following example:

IP = 168.34.26.58 Subnet = 255.255.255.248

This Subnet allows me to connect 5 computers in my LAN; by adding a second router, I can then assign a bigger subnet and make it an internal network. I could avoid a second router and make any of the machines within the 5 IP's a proxy server to control an internal LAN. Thereafter, the proxy will act as a router.

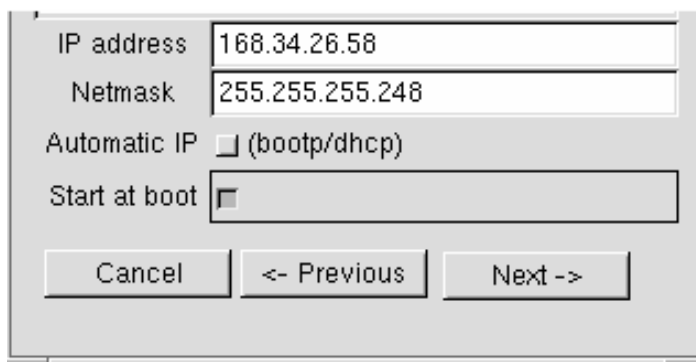


Fig. 2.46

Note: If the router was set to assign IP address automatically (DHCP) then instead of placing an IP here, just click on **Automatic IP (boot/dhcp)** and click on **Next**

- Make sure the start at boot is selected.
- Click on Next

Host name	server2.netcontrol.org
DNS server	168.34.0.2
Gateway (e.g. 168.34.0.1)	168.34.26.57

Fig. 2.47

Look at fig 2.47; it automatically took the host name and the DNS IP address from the net card. If you already entered the gateway it should appear here too; otherwise enter it now. For this to work the router must be configured properly as it is shown in figure 2.40

- Click Next

On the next screen you will see an option to enter the Proxy IP Address, but because we are not going out through a Proxy server we will leave this option blank.

Proxies configuration

HTTP proxy

FTP proxy

Track network card id (useful for laptops) ☐

Fig. 2.48

At this point you don't have a Proxy server. But in the future when your network grows, you may. A proxy server is a computer used between the router and the internal network as gateway, and provides Internet security to the internal LAN.

- **To continue with the last step click next.**

Congratulations, the network and Internet configuration is finished.
The configuration will now be applied to your system.

Fig. 2.49

- Click on **finish** to apply the settings.

Once you click on finish it will take you back to where you started on figure 2.42.

- Click on Apply, and then click on OK.
- Exit the control center.

Reboot the system. Launch your browser and enjoy your high-speed Internet connection.