

Using GNU Partition Editor

PARTITIONING THE HARD DRIVE

Hard drives may be logically divided into smaller sections named partitions. There are several good reasons to do this. The first reason is that you might want to run both Linux and Microsoft Windows using the same hard drive - each operating system requires its own partition. The second reason is that a basic Linux installation requires two partitions: one partition for the Linux files and the second partition for the swap space. Since most computers ship with Microsoft Windows pre-installed, we will assume that your computer's hard drive is configured with one large Windows partition.

Caution

Resizing your Windows partition is dangerous. You may lose all your data. Back up your data before attempting to resize the MS Windows partition. Read your Windows manual for directions about how to back up your data.

SHRINKING THE WINDOWS PARTITION

So we need three partitions, but the problem is that we already have MS Windows on our hard drive and its one partition has used all our hard drive space.

MS Windows tends to grab your entire hard drive. So if it's already on your hard disk, and you don't want to keep it, then you must shrink your Windows partition. You will need a specialized application to do this. Several utilities are available. The most common Microsoft Windows partition utility is Partition Magic from PowerQuest. Partition Magic costs money, but check the CD-ROMs that came with your system - many mainboards come with a free demo Partition Magic CD. Fortunately, there is a free software solution named GNU Partition Editor, or "parted".

But before resizing the Windows partition, you should trim the fat from your hard drive. Start your computer in

Windows, start up the Control Panel, and use the Add/Remove Software applet. Now remove any applications that you no longer use. You can also use Windows File Manager to look at your files and delete unused files and directories. (Remember to empty the windows recycling bin!) After you have removed all the unnecessary files, use the Windows File Manager to figure out how much of the hard drive Windows needs, and how much is empty. Using this information you can decide how much hard drive space is available for Linux. You will need at least 3 gigabytes (3,000 megabytes) for the installation described in this lesson. If you don't have 3 gigabytes available, then you must delete more files or buy a new hard drive.

Now you are ready to resize your hard drive. Put the parted boot disk in the floppy drive and start your computer. You might have to change the boot device (see the box title "Changing the Boot Device"). Parted will load a tiny version of Linux - you will see some diagnostic messages describing your computer hardware (don't worry, you don't need to understand them) and then you will see a text screen titled GNU Parted boot disk version 2. This screen gives you some basic instructions. But we have a very specific goal in mind, so just start the partition editor by typing the command "parted" followed by the enter key.

Now you should a (**parted**) prompt and a blinking cursor. Type the "print" command. Parted should show something like this:

```
Disk geometry for /dev/hda: 0.000-38931.046 megabytes
Disk label type: msdos
Minor  Start      End      Type      Filesystem  Flags
1      0.031    38931.046  primary   FAT         boot, lba
```

First, parted tells you how big your hard drive is. Parted describes the size of the hard drive in terms of its starting location (0 megabytes) and its ending location (38,931.046 megabytes). In other words, this is a 40 gigabyte hard drive. Next parted displays a table of information about all the partitions on the hard drive. The "minor" number is the partition number. Start and End are the beginning and

Changing the Boot Device

When the computer starts, it runs a small program stored in permanent memory. This small program is called the BIOS. The BIOS runs some tests, then loads a boot program from one of the devices. The boot program usually loads an operating system. Usually the BIOS loads the boot program from the hard drive, but the BIOS can be configured to load a boot program from CD-ROM, floppy, or a network card. When you turn on your computer you should see a message like `Press Del to enter setup`. When you see that message press the `Del` (or whatever other key your PC might indicate). Now you are in your computer's BIOS configuration program. This setup program controls how the computer's BIOS operates, so you should only change things if you know what you are doing. Here is what you need to know to tell your PC to boot from CD-ROM (or another device).

Once in the setup program, you should see a text menu. Unfortunately, the exact wording for the menu items might be different for different computers. You should see something like "Advanced BIOS Features". Often it is the second or third menu choice. Select that menu item using the arrow keys and pressing `Enter`. Now you will see a screen full of menu items, many or all of which you don't understand. Look for a menu item labelled `Boot Device` or `First Boot Device` and select it. You should see a pop-up menu with a list of boot devices. Select the CD-ROM device (move the highlight bar and press `Enter`). Then go back to the main menu using the `Esc` key, look for the **Save Settings** menu item and select it. Confirm that you want to save your changes and the computer should reboot - but this time the BIOS will fetch the boot loader from whatever device you specified.

ending of the partition, in megabytes. That's all we need to know to resize the partition.

Now we use the `resize` command to change the size of the Windows partition. The `resize` command follows the pattern

```
resize MINOR START END
```

Where `MINOR` is the partition number, `START` is where we want the partition to start (in megabytes), and `END` is where we want the partition to end (also in megabytes). In my case, I want to resize the partition to 20 gigabytes (20,000 megabytes) so I use the command:

```
resize 1 0.031 20000.000
```

It can take five or ten minutes to resize a large partition, so you might want to go get a coffee or something. When the resize operation is complete, parted will display it's (`parted`) prompt. Enter the quit command, then turn your computer off and take the GNU Partition Editor floppy out of the floppy drive.