

## Re: Adding FC5 to an XP computer –

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  - *Date:* Thu, 31 Aug 2006 06:57:03 -0700
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On 8/30/06, Bob Goodwin <[bobgoodwin@xxxxxxxxxxxxxx](mailto:bobgoodwin@xxxxxxxxxxxxxx)> wrote:

I'm about to add an 80G sata second drive to a Dell 2.8G XP computer that I wish to boot to both Linux and Windows XP. I have the FC5 DVD from which I intend to do the install.

What do I need to know before I start? XP Home is already installed and I have no way to reinstall it, no o/s CD's are provided. There will probably be choices for locating boot and grub, what is best to do there?

Any suggestions, reference material, etc. appreciated.

Bob Goodwin

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Hi Bob Goodwin!

Your basic plan sounds quite good.

Leaving the XP disk alone and using a new FC5 disk sounds very good. Pointing (using the XP boot loader defaulted to FC5) from XP as others have suggested, why not?

I will be doing a multiboot Ubuntu, FC5, Suse, Knoppix, and probably Solaris in the next month or so. What I would really like to do is to run a Linux (probably Ubuntu right now) and have XP available through a Virtual Machine Window. Oh there is never enough time it seems.

I am also putting together a "Boot Camp" presentation for our local LUGs. Please tell us how it all turned out.

I would copy your MBR and first 63 sectors (see the MBR Copy Appendix

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below), of the XP disk and of the new FC5 disk. Keep these on a CD or flash drive or other reliable place (e-mail?). As others have pointed out machine management SW and antivirus SW tend to take any changes to these as hostile and "repair" without asking. Yes you will need to shut off whatever caused this later but restoring the MBR is easier with copy saved outside the system and helpful to restore one if the MBR is damaged (like maybe by a virus).

I think it would be good to have some Live CDs on hand. They are wonderful for working with this kind of thing and tend to save your neck if something goes wrong. I like Puppy Linux because it comes up fast and has usable versions of the basic tools available (although it is often the busybox version which is limited). I like KNOPPIX since it is fairly comprehensive in both tools and very good at finding good hardware configurations.

Following are some reference materials from others I have written:

### Basic Thought:

Write down on a sheet of paper exactly what you want to do (large outline) then fill in the outline with specific steps with the exact GUI or command line commands to accomplish that. If there is info on the disk you need, transfer it elsewhere before you start!

### Dual Boot How-To(s):

<http://www.crhc.uiuc.edu/~mjmill2/howtos/dual-boot-linux-and-windows/>

<http://users.bigpond.net.au/hermanzone/p3.htm>

<http://www.linuxdevcenter.com/pub/a/linux/2006/05/08/dual-boot-laptop.html>

### GRUB:

<http://www.gnu.org/software/grub/manual/>

SEE GRUB APPENDIX BELOW

### MBR:

[http://en.wikipedia.org/wiki/Master\\_boot\\_record](http://en.wikipedia.org/wiki/Master_boot_record)

[http://www.geocities.com/thestarman3/asm/mbr/MBR\\_in\\_detail.htm](http://www.geocities.com/thestarman3/asm/mbr/MBR_in_detail.htm)

<http://www-128.ibm.com/developerworks/linux/library/l-linuxboot/>

<http://linuxgazette.net/issue63/okopnik.html>

SEE MBR COPY APPENDIX BELOW

Partitioning:

(Note: requires "find in document" "partition")

<http://www.ibiblio.org/pub/Linux/docs/HOWTO/other-formats/pdf/>

Re-size NTFS:

1. During the XP install process you can delete all of your partitions (you will need to fix the MBR to do so – see previous post – or do a "XP fix mbr" in Google and realize that if your system is simple (a C: drive only for XP) then just the "fixmbr" command will work).

2. Reduce the size of the XP partition – see below ("find on page" "ntfs"):

<http://www.linuxmigration.com/quickref/install/disk.html#ntfs>

<http://mlf.linux.rulez.org/mlf/ezaz/ntfsresize.html>

GRUB Appendix:

Shows techniques to find out how GRUB "sees" the drives attached (was written to an Ubuntu user doing dual boot with XP);

First I run grub with no flash drive attached (note the comments about "TAB" in the grub splash text):

-----

GNU GRUB version 0.97 (640K lower / 3072K upper memory)

[ Minimal BASH-like line editing is supported. For the first word, TAB lists possible command completions. Anywhere else TAB lists the possible completions of a device/filename. ]

```
grub> root (hd0,  
Possible partitions are:  
Partition num: 0, Filesystem type is ext2fs, partition type 0x83  
Partition num: 4, Filesystem type unknown, partition type 0x82
```

```
grub> root (hd0,  
-----
```

Note that at the first prompt I typed "root (" and THEN hit tab once. The command turned into "grub> root (hd0". I THEN hit the tab key again and it popped up the rest that we see.

I then exited grub with "quit" (yes, you MUST do this to see changes!!!). Plugged in my new 1G drive and entered grub again:

---

GNU GRUB version 0.97 (640K lower / 3072K upper memory)

[ Minimal BASH-like line editing is supported. For the first word, TAB lists possible command completions. Anywhere else TAB lists the possible completions of a device/filename. ]

```
grub> root (hd
Possible disks are: hd0 hd1
```

```
grub> root (hd1,0)
```

---

Note that this time grub found a second "hd1" and that when I had entered "hd1" the next tab yielded ",," and the next tab "0)".

Grub apparently finds bootable devices and simply labels them incrementally. If I want to make grub form a Master Boot Record for my flash drive then as I use it "right now" (with the drive plugged in this session" I will need to address the writing of that MBR to "hd1".

IT WOULD BE USEFUL TO SEE YOUR RESULTS OF DOING THE ABOVE (without the flash drive of course).

Grub also sees the partitions "one less (-1) from everybody else. Check it out!:

---

```
root@tod-desktop:~# df -a -h
Filesystem Size Used Avail Use% Mounted on
/dev/hda1 74G 50G 21G 72% /
proc 0 0 0 - /proc
/sys 0 0 0 - /sys
varrun 221M 80K 221M 1% /var/run
varlock 221M 4.0K 221M 1% /var/lock
procbusb 0 0 0 - /proc/bus/usb
udev 221M 136K 221M 1% /dev
devpts 0 0 0 - /dev/pts
devshm 221M 0 221M 0% /dev/shm
lrm 221M 19M 202M 9% /lib/modules/2.6.15-26-386/volatile
/dev/hdc 650M 650M 0 100% /media/cdrom0
/dev/hdd 338M 338M 0 100% /media/cdrecorder
/dev/sda1 961M 0 961M 0% /media/usbdisk
```

```
root@tod-desktop:~# fdisk -l
```

```
Disk /dev/hda: 81.9 GB, 81964302336 bytes
```

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255 heads, 63 sectors/track, 9964 cylinders  
Units = cylinders of 16065 \* 512 = 8225280 bytes

```
Device Boot Start End Blocks Id System
/dev/hda1 * 1 9800 78718468+ 83 Linux
/dev/hda2 9801 9964 1317330 5 Extended
/dev/hda5 9801 9964 1317298+ 82 Linux swap / Solaris
```

Disk /dev/sda: 1007 MB, 1007681536 bytes  
16 heads, 32 sectors/track, 3844 cylinders  
Units = cylinders of 512 \* 512 = 262144 bytes

```
Device Boot Start End Blocks Id System
/dev/sda1 * 1 3844 984048 e W95 FAT16 (LBA)
```

root@tod-desktop:~# parted

GNU Parted 1.6.25.1  
Copyright (C) 1998 – 2005 Free Software Foundation, Inc.  
This program is free software, covered by the GNU General Public License.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

Using /dev/hda

```
(parted) print
Disk geometry for /dev/hda: 0kB – 82GB
Disk label type: msdos
Number Start End Size Type File system Flags
1 32kB 81GB 81GB primary ext3 boot
2 81GB 82GB 1349MB extended
5 81GB 82GB 1349MB logical linux–swap
```

(parted) select /dev/sda

```
Using /dev/sda
(parted) print
Disk geometry for /dev/sda: 0kB – 1008MB
Disk label type: msdos
Number Start End Size Type File system Flags
1 16kB 1008MB 1008MB primary fat16 boot, lba
(parted)
```

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Now I show you the current /boot/grub/menu.lst (note: reduced in the hopes of getting this long e-mail through the "length filter"):

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```
root@tod-desktop:/boot/grub# cat menu.lst # Note: in FC5 this will
be grub.conf
```

```
# menu.lst – See: grub(8), info grub, update-grub(8)
# grub-install(8), grub-floppy(8),
# grub-md5-crypt, /usr/share/doc/grub
# and /usr/share/doc/grub-doc/.
```

```
## default num
```

```
# Set the default entry to the entry number NUM. Numbering starts from 0, and
# the entry number 0 is the default if the command is not used.
```

```
#
```

```
# You can specify 'saved' instead of a number. In this case, the default entry
# is the entry saved with the command 'savedefault'.
```

```
# WARNING: If you are using dmraid do not change this entry to 'saved' or your
# array will desync and will not let you boot your system.
```

```
default 0
```

```
## timeout sec
```

```
# Set a timeout, in SEC seconds, before automatically booting the default entry
# (normally the first entry defined).
```

```
timeout 3
```

```
## ## End Default Options ##
```

```
title Ubuntu, kernel 2.6.15-26-386
```

```
root (hd0,0)
```

```
kernel /boot/vmlinuz-2.6.15-26-386 root=/dev/hda1 ro quiet splash
```

```
initrd /boot/initrd.img-2.6.15-26-386
```

```
savedefault
```

```
boot
```

```
title Ubuntu, kernel 2.6.15-26-386 (recovery mode)
```

```
root (hd0,0)
```

```
kernel /boot/vmlinuz-2.6.15-26-386 root=/dev/hda1 ro single
```

```
initrd /boot/initrd.img-2.6.15-26-386
```

```
boot
```

```
title Ubuntu, memtest86+
```

```
root (hd0,0)
```

```
kernel /boot/memtest86+.bin
```

```
boot
```

```
### END DEBIAN AUTOMAGIC KERNELS LIST
```

```
root@tod-desktop:/boot/grub#
```

```
-----
```

MBR Copy Appendix:

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As promised, an itty bitty how-to on making a copy of your Master Boot Record and the first portion (often containing partition and content info) of the boot disk.

In this case I was fascinated by the "boot" flag set looking at my new flash drive so I wanted to take a look at it's MBR. The command I usually use to do this is:

```
dd if=/dev/hda of=mbr.bin bs=512 count=1
```

and the command to take a "snapshot" of the first sectors:

```
dd if=/dev/hda of=mbr63s.bin bs=512 count=63
```

To read the flash drive I modify the command to:

```
root@tod-desktop:/boot/grub# cd /home/tod
root@tod-desktop:~# pwd
/home/tod
root@tod-desktop:~# dd if=/dev/sda1 of=pnymbr.bin bs=512 count=1
1+0 records in
1+0 records out
512 bytes (512 B) copied, 0.000423 seconds, 1.2 MB/s
```

This yeilds "pnymbr.bin" in my /home/tod directory. This is a copy of my Master Boot Record.

```
root@tod-desktop:~# dd if=/dev/sda1 of=pny63s.bin bs=512 count=63
63+0 records in
63+0 records out
32256 bytes (32 kB) copied, 0.01087 seconds, 3.0 MB/s
root@tod-desktop:~#
```

Which yields "pny63s.bin which is a copy of the first 63 sectors.

Likely this will loose formatting but here is a hexdump of the PNY flash drive MBR:

```
root@tod-desktop:~# hexdump -C pnymbr.bin

00000000 eb 3c 90 44 4f 4b 30 31 2e 30 32 00 02 20 01 00 |<.DOK01.02.. ..|
00000010 02 00 02 00 00 f8 f1 00 20 00 10 00 20 00 00 00 |..... .. ..|
00000020 e0 07 1e 00 80 00 29 c5 4b f6 f0 00 00 00 00 00 |.....).K.....|
00000030 00 00 00 00 00 00 46 41 54 31 36 20 20 20 33 c9 |.....FAT16 3.|
00000040 8e d1 bc fc 7b 16 07 bd 78 00 c5 76 00 1e 56 16 |...{...x..v..V.|
00000050 55 bf 22 05 89 7e 00 89 4e 02 b1 0b fc f3 a4 06 |U."..~..N.....|
00000060 1f bd 00 7c c6 45 fe 0f 38 4e 24 7d 20 8b c1 99 |...|.E..8N$} ...|
00000070 e8 7e 01 83 eb 3a 66 a1 1c 7c 66 3b 07 8a 57 fc |.~....:f.;..W.|
00000080 75 06 80 ca 02 88 56 02 80 c3 10 73 ed 33 c9 fe |u.....V....s.3..|
00000090 06 d8 7d 8a 46 10 98 f7 66 16 03 46 1c 13 56 1e |..}.F...f..F..V.|
```

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```
000000a0 03 46 0e 13 d1 8b 76 11 60 89 46 fc 89 56 fe b8 |.F...v.`.F..V..|
000000b0 20 00 f7 e6 8b 5e 0b 03 c3 48 f7 f3 01 46 fc 11 | ....^...H...F..|
000000c0 4e fe 61 bf 00 07 e8 28 01 72 3e 38 2d 74 17 60 |N.a....(.r>8-t.`|
000000d0 b1 0b be d8 7d f3 a6 61 74 3d 4e 74 09 83 c7 20 |.....}.at=Nt... |
000000e0 3b fb 72 e7 eb dd fe 0e d8 7d 7b a7 be 7f 7d ac |;.r.....}{...}|
000000f0 98 03 f0 ac 98 40 74 0c 48 74 13 b4 0e bb 07 00 |.....@xxxxxxxxxxx|
00000100 cd 10 eb ef be 82 7d eb e6 be 80 7d eb e1 cd 16 |.....}....}....|
00000110 5e 1f 66 8f 04 cd 19 be 81 7d 8b 7d 1a 8d 45 fe |^f.....}.}..E.|
00000120 8a 4e 0d f7 e1 03 46 fc 13 56 fe b1 04 e8 c2 00 |.N....F..V.....|
00000130 72 d7 ea 00 02 70 00 52 50 06 53 6a 01 6a 10 91 |r....p.RP.Sj.j..|
00000140 8b 46 18 a2 26 05 96 92 33 d2 f7 f6 91 f7 f6 42 |.F.&...3.....B|
00000150 87 ca f7 76 1a 8a f2 8a e8 c0 cc 02 0a cc b8 01 |...v.....|
00000160 02 80 7e 02 0e 75 04 b4 42 8b f4 8a 56 24 cd 13 |.~..u..B...V$..|
00000170 61 61 72 0a 40 75 01 42 03 5e 0b 49 75 77 c3 03 |aar.@xxxx^.Iuw..|
00000180 18 01 27 0d 0a 49 6e 76 61 6c 69 64 20 73 79 73 |..'..Invalid sys|
00000190 74 65 6d 20 64 69 73 6b ff 0d 0a 44 69 73 6b 20 |tem disk...Disk |
000001a0 49 2f 4f 20 65 72 72 6f 72 ff 0d 0a 52 65 70 6c |I/O error...Repl|
000001b0 61 63 65 20 74 68 65 20 64 69 73 6b 2c 20 61 6e |ace the disk, an|
000001c0 64 20 74 68 65 6e 20 70 72 65 73 73 20 61 6e 79 |d then press any|
000001d0 20 6b 65 79 0d 0a 00 00 49 4f 20 20 20 20 20 20 | key...IO |
000001e0 53 59 53 4d 53 44 4f 53 20 20 20 53 59 53 7f 01 |SYSMSDOS SYS..|
000001f0 00 41 bb 00 07 60 66 6a 00 e9 3b ff 00 00 55 aa |.A...`fj;...U.|
00000200
```

It does have the "AA55" magic number at the end and probably a jump command at the beginning doing a read of the error message seen.

Have fun!

Tod

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