Make a Bootable USB Flash Drive from the Restored Edition of Hiren's Boot CD

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Contents

Introduction

We describe how the files of the restored/extended Hiren's BootCD (HBCD) can be transferred to a USB memory stick (flash drive) and how the later can be made bootable using exclusively tools provided by the HBCD. The quickest and most accurate method is to use Linux command line tools, however Windows can be also used with equally good results. The restored edition of Hiren's Boot CD employs a combination of the bootloaders syslinux and grub4dos; so the method described in Hiren's web page[1] does not work for the restored edition. Until recently, because of the limitations of the bootloader syslinux, USB flash drives could only be formated FAT32. Now syslinux can boot from NTFS partitions (it is even possible to boot HBCD from large external hard disks) so we describe this option too. Multipartitioning USB flash drives has some difficulty because Windows can only recognize the first partition. We describe how to partition a USB flash drive and then persuade Windows to recognize the partitions.

Warning: If you use a method other than the ones described here, please note that simply copying the files over to an already used USB stick is unlikely to work and some utilities may fail to boot. When transferring iso images to bootable USB sticks or drives, care must be taken so that iso images are written **contiguously**. If an iso image is fragmented it will not boot. Fragmentation happens when files are written in space left by the deletion of other files. For example if a small file is deleted and subsequently a larger file is written, chances are, the larger file will be fragmented. Always use a freshly formated stick where nothing has been deleted. Using defragmentation software on USB flash drives is not recommended because the repeated read/writes will shorten their life span.

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[1] http://www.hiren.info/pages/bootcd-on-usb-disk

1 Linux Method

- Insert Hiren's Restored BootCD, boot the computer from it and select SystemRescueCD Linux (from the Linux option of the main menu).

- Insert a 4 Gb (or larger) USB stick.[1] If you have a large USB stick (8 GB or more) and plan to store large files,[2] you may prefer to format it NTFS[3] instead of the usual FAT32. Instructions for both cases are given bellow. **Warning: All data on the USB stick will be erased.**

- When the command prompt appears, type the following commands exactly as they appear in the list below after you replace the **xx**'s with what is appropriate for your USB flash drive e.g. `sdb1` or `sdc1`.[4] **Warning: If you get xx wrong you may erase your hard disk.**

Command	Explanation
`umount /dev/sdxx`	In case the stick has been already automounted, unmount it first.
Type one of the next two commands:	
`mkfs.vfat -F32 -n HBCD152 /dev/sdxx`	Format the stick (FAT32).
`mkntfs -Q -I -L HBCD152 /dev/sdxx`	Format the stick (NTFS).
`mkdir /mnt/USB`	Create a USB mountpoint.
`mount /dev/sdxx /mnt/usb`	Mount the stick.
`mount /dev/sr0 /mnt/cdrom`	Mount the CD.
`cp -Rfv /mnt/cdrom/* /mnt/usb/`	Copy files to the stick, and wait for some time...
`sync`	Flush any pending buffered data.
`umount /mnt/usb`	Unmount the USB.
`cd /mnt/cdrom/isolinux`	The syslinux installer lives there.
`./syslinux -i -d isolinux /dev/sdxx`	Install the bootloader.
`dd if=./mbr.bin of=/dev/sdx`	Install the bootloader's MBR.
`parted /dev/sdx set 1 boot on`	Make the stick active, i.e. bootable.
`sync`	Flush again.

- In the last two commands before `sync`, `sdx` must be a device e.g., `sdb` or `sdc`, and **not** a partition `sdb1` or `sdc1`.

- Kaspersky Rescue Disk needs the volume label to be 'HBCD152' or it will not be able to locate its files. If you change this label you must also edit the file `/isolinux/antivirus.cfg` and change the label there too.

- Reboot the computer and test the stick for booting.

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[1]The actual capacity needed for HBCD is 2.9 GB. The spare capacity is available to store other files.
[2]Under FAT32 attempting to write file sizes greater than 4 GB causes data corruption without warning.
[3]Note, however that some self booting utilities (e.g. Acronis) may fail to start from NTFS. See Section 4.
[4]You can determine the correct device letters with the command: "`fsarchiver probe`" or "`parted -l`".

2 Windows Method

- Insert Hiren's Restored BootCD, boot the computer from it and select Mini Windows XP or Mini Windows 7.

- Insert a 4 Gb (or larger) USB stick.[1] **Warning: All data on the USB stick will be erased.**

- Run the USB Format Tool, found in the HBCD Program Launcher, under the item Partition/Boot/MBR,
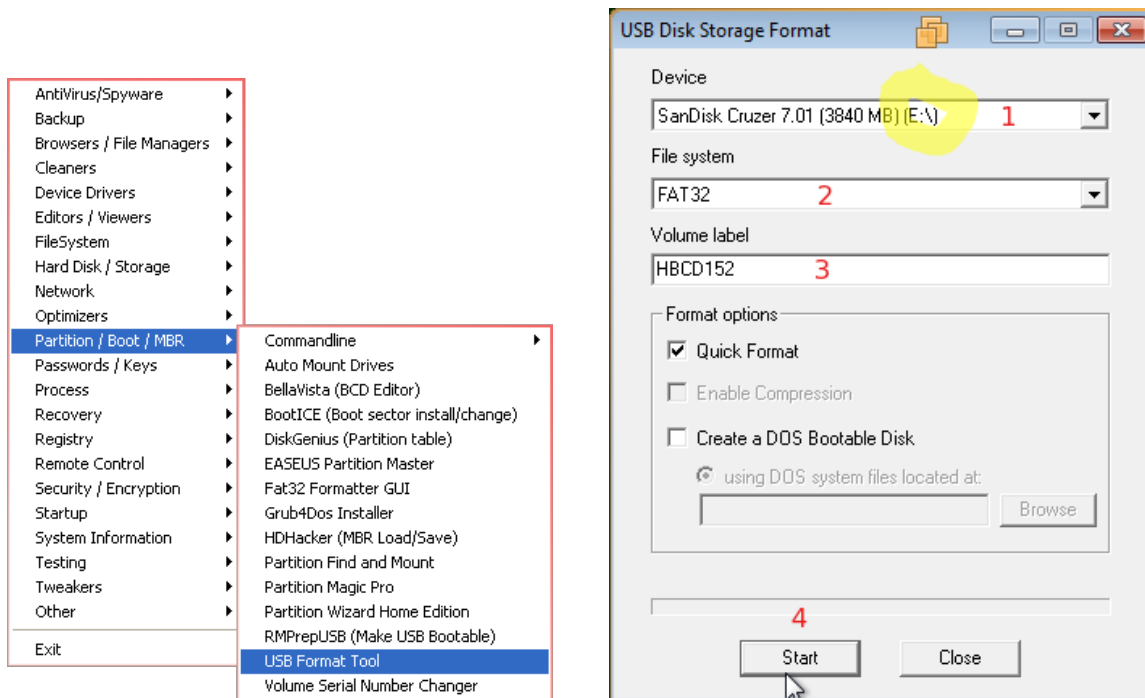
1. Select USB device.
2. Choose FAT32 or NTFS,[2] and note the drive letter for later use.
3. Type the Volume Label HBCD152 (see note in Linux method).
4. Click Start to format the stick.

- Copy all the files from the CD to the USB flash drive.
  For this you may 'Select All' (CTRL-A) and then 'Drag-and-Drop' or 'Copy' (CTRL-C) and then 'Paste' the files (CTRL-V).[3]

- Go to My Computer, find the CD, right click on the isolinux subfolder and then 'Command Prompt Here'.

- In the console window type the command:

  syslinux.exe -maf -d isolinux Y:

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[1] The actual capacity needed for HBCD is 2.9 GB. The spare capacity is available to store other files.

[2] If you have a large USB stick (8 GB or more) and plan to store large files, you may prefer to format it NTFS instead of the usual FAT32. Under FAT32, attempting to write file sizes greater than 4 GB, causes data corruption without warning.

[3] Mini Windows XP and Mini Windows 7 automatically use TeraCopy to handle all file copy/move operations, including Drag-and-Drop. TerraCopy is extremely fast, it can pause/resume and gives information in case of errors.

where 'Y' is the USB drive as noted from above. This command installs the bootloader, the MBR and activates the USB for booting.

- Safely remove the stick and test for booting.

3   Alternative Windows Method (RMPrepUSB)

The utility RMPepUSB (found in Partition/Boot/MBR of the HBCD Program Launcher menu) can format, copy the files, and install the bootloader in one go. However it can only format FAT32 (actually it cannot install syslinux on NTFS, so when syslinux is selected as the bootloader, the NTFS option is greyed out). Also, it is excruciating slow when copying files to the flash drive.

- Set the utility's options as shown below and click Prepare Drive. Unless you are familiar with this utility do not meddle with any of the other settings.
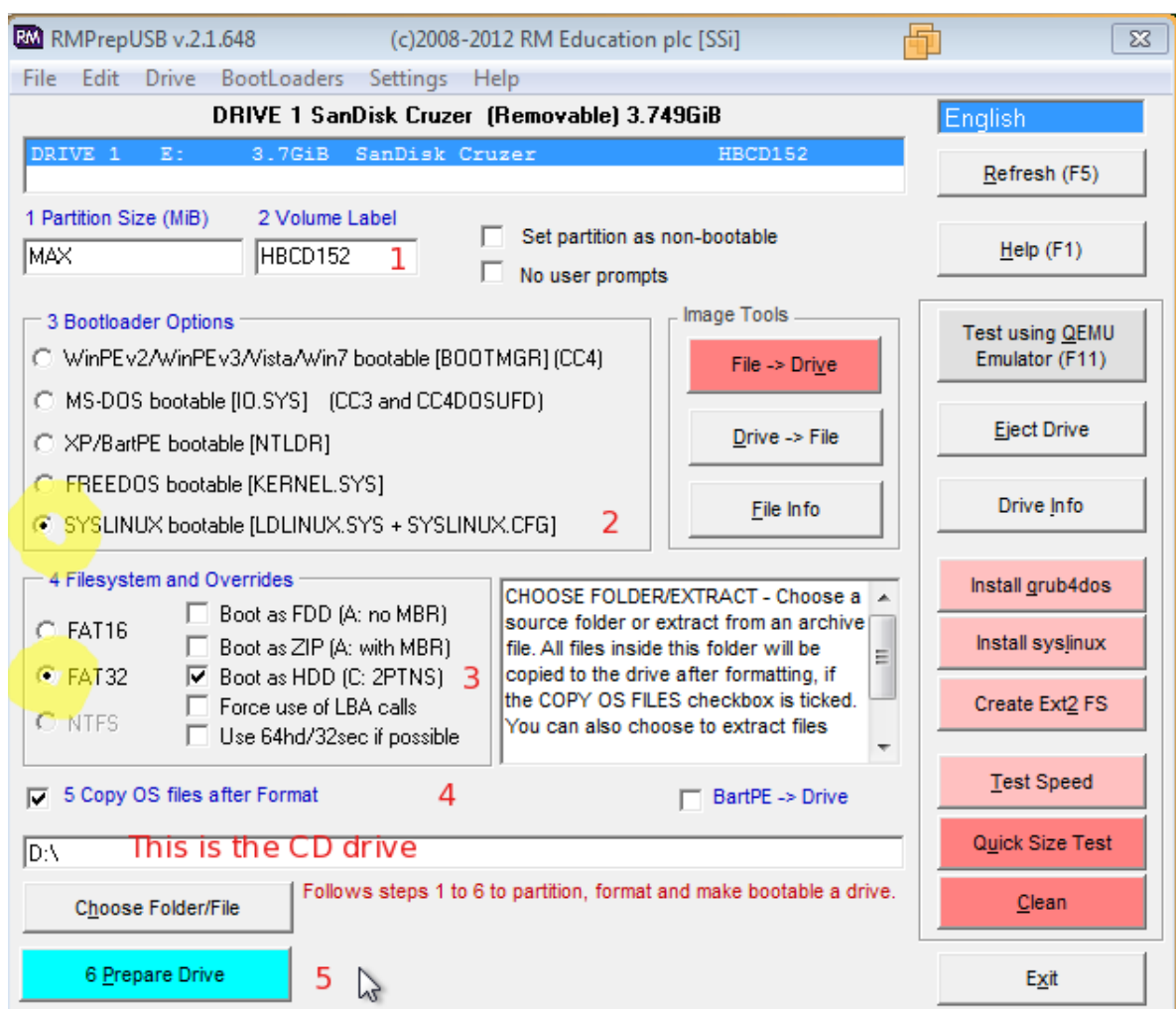
- Wait (copying the files takes a long time with this utility; so be patient) and, when prompted, answer the two questions as indicated in the screenshots shown below:
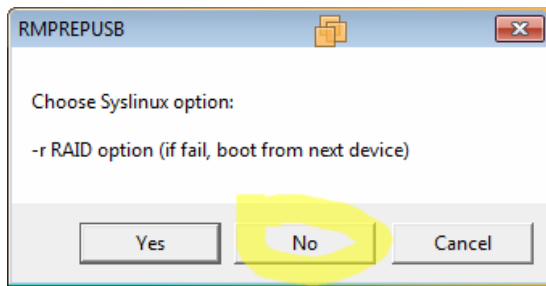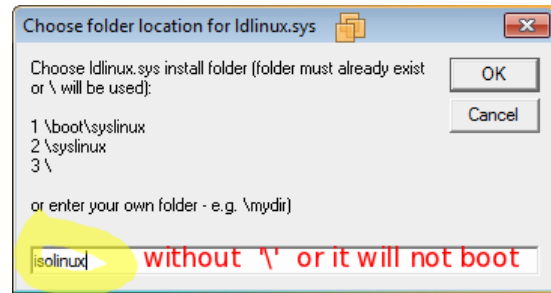
Click 'No'   Type `isolinux` (**without backslash**)

4   HBCD on a Partitioned USB Flash Drive

Although the NTFS file system can store large files without data corruption, FAT32 boots faster.
Also, some of the self booting utilities may fail to boot from NTFS. Booting syslinux from an
NTFS partition is very new and not very well documented. Ideally therefore a large USB flash
drive could be partitioned to have a 4 GB FAT32 partition for HBCD and the remainder formated
with NTFS for storing large iso images (e.g. Windows, Linux and applications installation
DVDs). As an example, consider a 16 GB USB flash drive. We shall partition it with a 4 GB
FAT32 partition for HBCD and the remainder 12 GB will be formatted NTFS to store data.

4.1   Create the partitions

On Hiren's Boot CD there are many partitioning utilities, in this case, however, we shall the
command line linux utility `parted` because it accepts partition sizes as percentages of the total
size and then it takes care automatically the proper sector alignments.

- Insert USB stick and HBCD and boot to SystemRescueCD as described in section 1.

- In the command prompt type '`parted -l`' (lists all disk drives and all their partitions)
  to determine the device letter of the USB stick. We shall assume here that our USB flash
  drive is device `sdb`

- Type the following commands.

Command	Explanation
`parted /dev/sdb`	Start the partition editor on the USB device.
`rm 1`	Delete existing partition.
`mkpart primary fat32 0% 25%`	Create the 4 GB FAT32 partition.
`mkpart primary NTFS 25% 100%`	Create the 12 GB NTFS partition.
`set 1 boot on`	Make FAT partition active (bootable).
`print`	Print the partition information.
`quit`	Exit from the partition editor.

If all is in order, the print command should give an output showing the new partitions:

```
Model: USB 2.0 Flash Disk (scsi)
Disk /dev/sdb: 16,3GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:
Number  Start   End    Size    Type     File system  Flags
1       1049kB  4063MB 4062MB  primary  fat32        boot, lba
2       4063MB  16,3GB 12,2GB  primary  ntfs
```

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4.2 Format the partitions and transfer HBCD to USB

The following commands are similar to those in section 1. We format the two partitions and we copy the HBCD files to the first partition.

Command	Explanation
`mkfs.vfat -F32 -n HBCD152 /dev/sdb1`	Format 1st partition (FAT32)
`mkntfs -Q -I -L DATA /dev/sdb2`	Format 2nd partition (NTFS)
`mkdir /mnt/USB`	Create a USB mountpoint.
`mount /dev/sdb1 /mnt/usb`	Mount the stick.
`mount /dev/sr0 /mnt/cdrom`	Mount the CD.
`cp -Rfv /mnt/cdrom/* /mnt/usb/`	Copy files to the stick, and wait for some time...
`sync`	Flush any pending buffered data.
`umount /mnt/usb`	Unmount the USB.
`cd /mnt/cdrom/isolinux`	The syslinux installer lives there.
`./syslinux -i -d isolinux /dev/sdb1`	Install the bootloader.
`dd if=./mbr.bin of=/dev/sdb`	Install the bootloader's MBR.
`sync`	Flush again.

Reboot the computer and test the stick for booting.
The second (NTFS) partition is also ready for use.

4.3 Making the second partition visible to Windows

Windows sees USB flash drives as Removable Storage Devices (same category as CD and DVD) and as such will not permit their partitioning.[1] Moreover, if we create partitions with other utilities (as we did just now) Windows will recognize only the first partition. This section shows how to install a driver that will make widows see the flash drive as a Local Disk and therefore recognise all the partitions.

- Insert HBCD USB as created in the previous section and boot from it into Mini Windows XP. We can do this because the first partition is always visible.

- Right click on My Computer and select Device Manager

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[1]Windows allows partitioning and formating NTFS only for what it calls Local Disks.
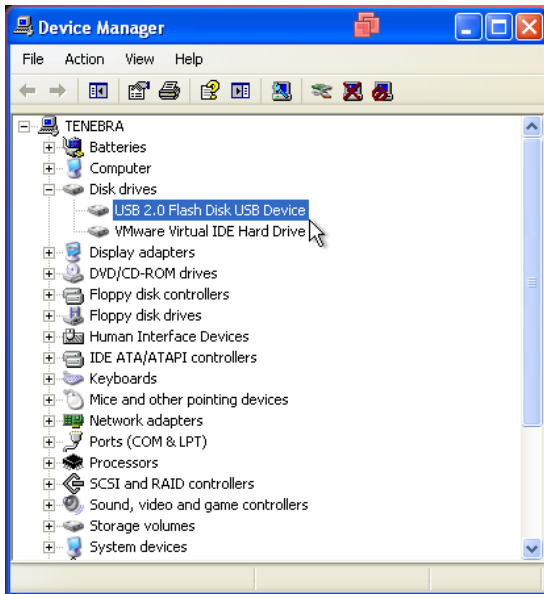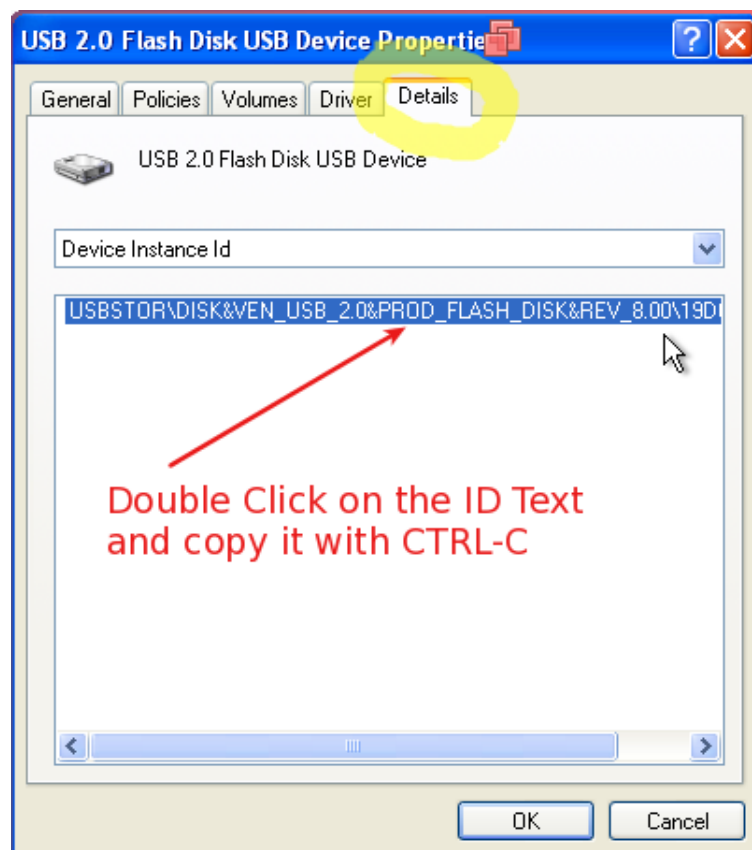
Right click on USB device   Select Properties
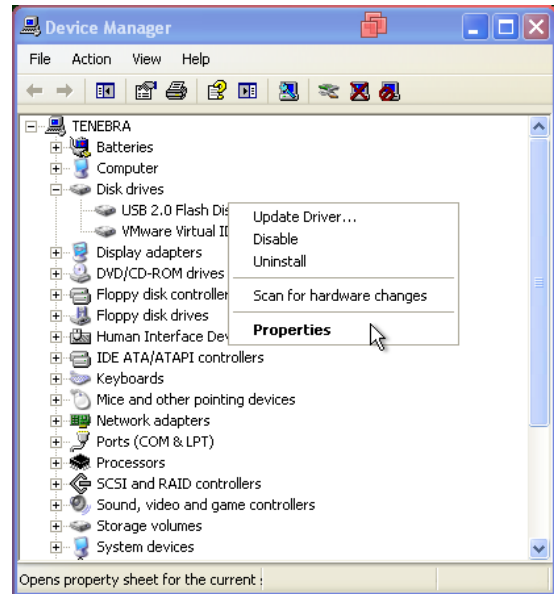
- Go to the Details tab and copy the Device instance Id.

- With Windows Explorer, go to the HBCD USB drive and navigate to the folder \Bootprog\usb-disk-driver. Open the file cfadisk.ini with Notepad and go to line 26.

Select the text shown above and press CTRL-V to replace it with the Device instance Id previously copied. The edited line 26 should now be like this:


Save the file and close Notepad. Now the cfadisk.inf is configured for your particular USB flash drive and the driver can be installed in any Windows computer as follows.[1]

• **Installing the driver**. Boot into your installed Windows and go to the Device Manager. Right click on the USB flash drive and select Update Driver to start the Hardware Update Wizard, and follow the sequence illustrated below.
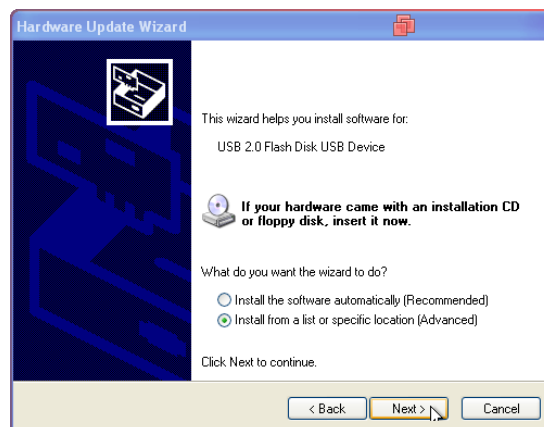

• Point the wizard to the folder where cfadisk.inf is found and install the driver.

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[1] Mini Windows XP and Mini Windows 7 are already modified and see USB flash drives as local disks, so installing the driver is not required

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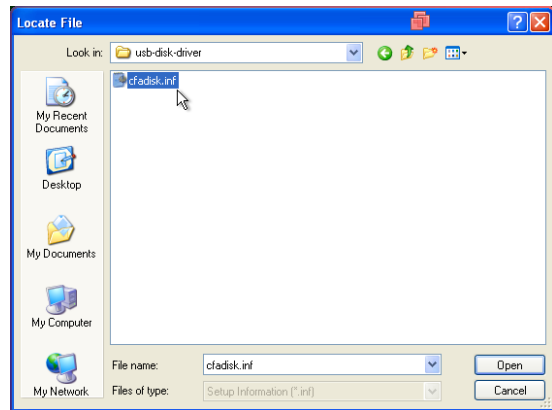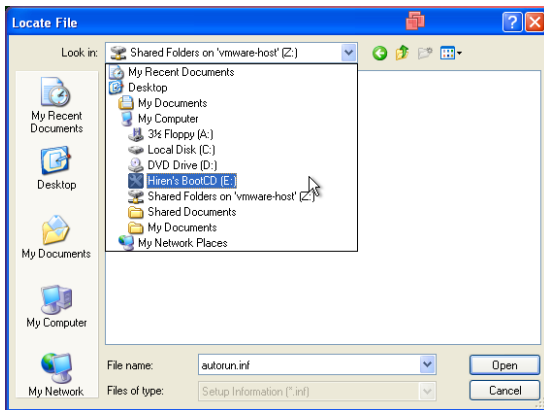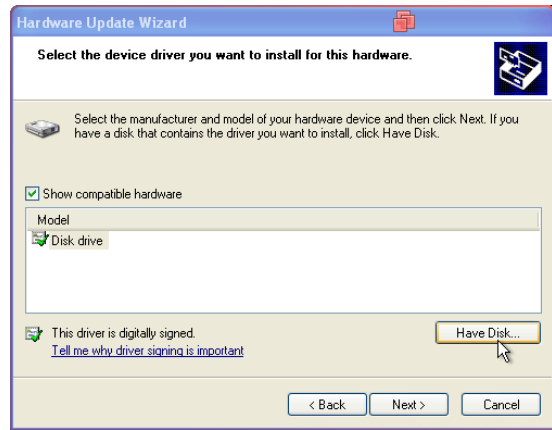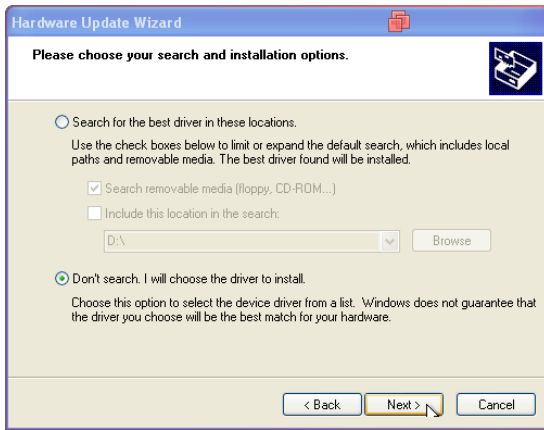
Do not restart the computer (ignore the message). Unplug and reconnect the flash drive. If everything has been done correctly the USB flash drive should now appear as a regular local disk with both partitions visible.
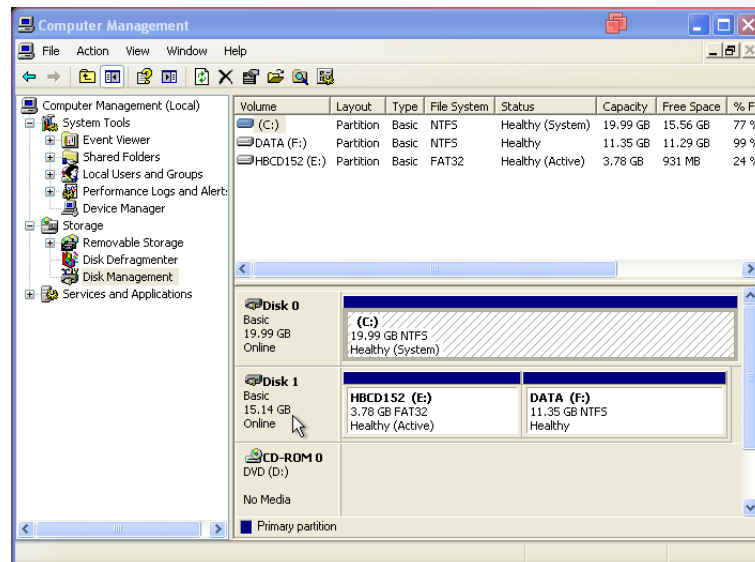
- Hereafter, whenever this flash drive is connected for the first time to a Windows machine, you need to install the driver (the last step) so that the new host will know to treat this flash drive as a Local Disk and be able to see all partitions.

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5   Computers without optical drive

If your computer has no optical drive and has Windows XP or Windows 7 installed you have the following options:

- Use a CD emulator such as Alcohol 120% or Daemon Tools to mount the .iso, start the HBCD Program Launcher and run the utilities from the emulated optical drive, as described above. The utilities are portable and work with all Windows versions.

- Use Virtual PC software such as VMware Workstation, VirtualBox or Qemu to create a virtual PC in your computer and boot the .iso directly. In this case any of the 3 above methods are possible.

If the computer has only Linux, then you need to have the partition editor parted and the bootloader syslinux installed. Test their availability with:
```
parted --version
```
and
```
syslinux --version
```
(need >4.5).
If not available install them from your distro's repositories.
Then follow the instructions as above, but instead of the cdrom, mount the .iso with a command like:
```
mount -o loop,user <path-to-iso-file.iso> /mnt/cdrom
```