How to install and run a FULL Windows XP from a USB drive 12 Apr 2008

The ultimate guide for installing and running Windows XP from a USB stick / HDD drive

What is this about?

To keep the introduction short, Microsoft denies that booting Windows off a USB drive works.

See this page for example. It says:

> *Q: Can a USB storage device be the primary (and only) means of storage?*
> *No. USB-based mass storage devices cannot be the primary hard disk storage solution on a regular system ...*

Or this one from the microsoft newsgroups:

> *Windows cannot boot from an USB drive. If your computer supports*
> *booting from such device, you can load a boot loader to the USB device*
> *which starts Windows XP from the HDD.*

Anyway, the web is full of those. I was wondering about the same thing, as i did not want to put a Windows partition on my Linux.based work laptop, and thought it was a good idea to run Windows XP off a USB Hard drive that i just plug in when i need it, and boot from it. To put a long story short, this is exactly what i do now, thanks to the fantastic research of the people credited below. However, it took me significant time to figure out all the painful little problems, and i was not fully happy with the current official guide by Dietmar (no pun, he was the first to make ANYthing public). I wanted an easy guide that allows creating a modified version of the Windows XP CD, for painless and transparent installation to as many systems as you want.

This page is the result of my work. Have fun!

Credits

...must go to the people that made this guide possible in the first place. In recent months, a few blokes going by the handles of **mkiaer**, **Dietmar** and **sisal** and a few others from the 911.net forums came up with many good pieces of research on how to enable any NT-based Windows to boot from a USB-drive. Little of this guide would exist without them - in fact the only reason why i write this up is that my particular solution seems to be lower effort than any of the steps i saw before. Many of the steps here are the result of their research.

Version History:

- v1.0 - 3rd Mar 2006
  rewritten, tested and working against two different drives with my laptop.
- v0.9 - 29th Feb 2006
  initial version, untested

What works?

Basically, everything as far as i can see. After completing this tutorial, your Windows XP install should directly boot off your USB-drive, and be fully upgradable, DirectX games will run, all apps i tested work like normal, speed is the same as with a real HDD (you need USB2 though) - so it is in fact a fine solution as far as i can see.

Host Hardware	USB hardware	Successful
Dell Latitude D820	WD Pocket Drive 80gb	Yes
DFI Infinity Ultra 2	Dane Elec 4GB USB Stick	Yes
Asus M2A-VM HDMI	Adata PD2 4GB Stick	Yes
HP Compaq 6510b	WD 2908A	Yes
Compaq nc6400	WD2500BEV	Yes
Compaq nc6400	Trekstore i.Beat 2GB	No
Compaq nc6400	Hitachi DK23EA-30	No

Compaq nc6220	TrackStore DataStation XU	Yes
HP Pavillion dv6700t	InfoSafe USB with Toshiba SATA 250GB	Yes
Compaq nc6120	Lacie 80gb	Yes
Asus P5LD2-VM	Vantec IDE to USB cable + Maxtor 60gb PATA	Yes
Thinkpad T42	WD HDD Passport 2	Yes
Acer Aspire 5600	Ipod 20g Photo	Yes
Thinkpad T43	Generic 80gb USb2 case	Yes
HP Pavillion dv1000	Generic USB2 HDD	Yes
Thinkpad R61	Generic USB2 / Seagate 120 GB	Yes
Dell Latitude D620	PQI i221 USB stick	Yes
Fujitsu Lifebook E8410C	Shintaro USB2 + 80GB Samsung	Yes
Dell Inspiron 6400	generic USB2 enclosure	Yes
Intel 945 GNT	Kingston 4GB SDHC with USB adapter	Yes
HP nx6110	Sandisk Cruze 8gb	Yes
HP nx6110	OneTouch4 Mini	No
Dell Latitude D620	Seagate FreeAgent 500GB	Yes
Acer Aspire 5710G	Adata 4GB stick	Yes
...and LOTS more...		

Disclaimer

This is a hobby project of mine. I will not assume ANY responsibility for the correctness of this guide, nor can I be made liable for any errors, hardware or software problems / loss that are caused by following this guide. Basically, if things screw up, its your own fault. Do not follow the guide if you fear data loss.

Requirements

- An existing Windows install for carrying out the steps in this tutorial
- A USB2-compliant Hard disk drive (or a big USB2 stick, see remarks below)
- An original Windows XP CD (tested only against SP1 so far, but reported to work on other versions)
- A registered version of WinISO (or any other software that allows direct editing of ISO files)
- The Microsoft CAB SDK
- A CD-burning software that can handle ISO files. I like the free burnatonce

How To:

Summary:

We will dump the contents of your original Windows XP CD , extract a few files from the Image using ISO modification software, edit the files, and put the modified versions back on the ISO. The resulting ISO image is burnt back onto a CD media, and can then directly be used to install Windows on your USB drive.

I am also covering a few pitfalls that happened to me, in hope they will save you a bit of time.

1) Does your computer support booting from USB?

Usually, if its an option in your BIOS boot sequence menu, the answer to this is yes. If its not there, look for BIOS updates. If you are not sure, proceed and see what happens ;-)

2) Sorting out the "Bootability" of your USB-Drive

Connect your USB drive to your computer, directly, without a Hub. Then, shut down your computer, disconnect any other hard disk drives from it, and insert your original Windows XP CD into the drive. Start the installation, and proceed to the section where you are allowed to pick a hard drive. If it goes beyond the partition selection, your drive is already fine for booting Windows XP. If not (seems to be the cases with many of the Freecom USB HDDs for example), you will get an error like "Windows is unable to find your drive, partition, data etc bla". This is usually not a big problem. All you need to do is "properly" format the drive. Reboot into your normal Windows, and get this HP tool , and use it to format your HDD completely. I chose NTFS format, worked fine everytime i tried. After this, my drives are recognized as valid installation devices by the Windows XP installer.
(In fact, i did not manage to create a USB primary partition with FAT32 that was recognized as being installable)

3) Dumping the original Windows CD into an ISO File

Pretty easy one. Simply open WinISO, and select Actions -> Make ISO from CDROM, and save your CD image.

4) Extracting the files we need to work on

After the CD dump is done, close and reopen WinISO. Then, open the ISO file you just created using File -> Open. Now, click the I386 folder, and select the following files (Ctrl key to multi-select)

- TXTSETUP.SIF
- DOSNET.INF
- USB.IN_
- USBPORT.IN_
- USBSTOR.IN_

Select Actions -> Extract and put the resulting files into some folder to work on them.

5) Unpacking IN_ files

Use the Cab SDK (from the command line) for extracting the contents of the .IN_ files. Each of them contains exactly one .inf file. If you are unsure how to use the Cab SDK, here is an example command line: "cabarc x USBSTOR.IN_" . You should end up with three new files in the folder, called:

- usb.inf
- usbport.inf
- usbstor.inf

You can now delete the .IN_ files.

6) Editing the files

This is the main job. i ll also try to explain a bit whats happening. Use a simple Texteditor like Notepad.

6-A) TXTSETUP.SIF

This file is loaded on the initial install step by the Windows XP CD installer. In this file, we will change the way Windows treats USB devices during system setup -- the default is to only treat them as input devices during installation -- we will change this to include mass storage driver support (which needs to be loaded into the installer much earlier in order to work).

First, move the following entries from [InputDevicesSupport.Load] to the [BootBusExtenders.Load] section , as shown here

```
[BootBusExtenders.Load]
pci = pci.sys
acpi = acpi.sys
isapnp = isapnp.sys
acpiec = acpiec.sys
ohci1394 = ohci1394.sys
usbehci = usbehci.sys
usbohci = usbohci.sys
usbuhci = usbuhci.sys
usbhub = usbhub.sys
usbstor = usbstor.sys


[InputDevicesSupport.Load]
usbehci = usbehci.sys
usbohci = usbohci.sys
usbuhci = usbuhci.sys
usbhub = usbhub.sys
usbccgp = usbccgp.sys
```

```
        hidusb = hidusb.sys
        serial = serial.sys
        serenum = serenum.sys
        usbstor = usbstor.sys
```

... now the same for [BootBusExtenders] and [InputDevicesSupport]

```
        [BootBusExtenders]
        pci = "PCI-Bustreiber",files.pci,pci
        acpi = "ACPI Plug & Play-Bustreiber",files.acpi,acpi
        isapnp = "ISA Plug & Play-Bustreiber",files.isapnp,isapnp
        acpiec = "Integrierter ACPI-Controllertreiber",files.none,acpiec
        ohci1394 = "IEEE-1394-Bus-OHCI-konformer Anschlusstreiber",files.ohci1394,ohci1394
        usbehci = "Erweiterter Hostcontroller",files.usbehci,usbehci
        usbohci = "Open Hostcontroller",files.usbohci,usbohci
        usbuhci = "Universeller Hostcontroller",files.usbuhci,usbuhci
        usbhub = "Standard-USB-Hubtreiber",files.usbhub,usbhub
        usbstor = "USB-Speicherklassentreiber",files.usbstor,usbstor
```

```
        [InputDevicesSupport]
        usbehci = "Erweiterter Hostcontroller",files.usbehci,usbehci
        usbohci = "Open Hostcontroller",files.usbohci,usbohci
        usbuhci = "Universeller Hostcontroller",files.usbuhci,usbuhci
        usbhub = "Standard-USB-Hubtreiber",files.usbhub,usbhub
        hidusb = "HID-Parser",files.hidusb,hidusb
        serial = "Treiber fï¿½r seriellen Anschluss",files.none,serial
        serenum = "Enumerator fï¿½r seriellen Anschluss",files.none,serenum
        usbstor = "USB-Speicherklassentreiber",files.usbstor,usbstor
        usbccgp = "USB Generic Parent Driver",files.usbccgp,usbccgp
```

Next, we also have to write several keys into the registry. Convieniently, the txtsetup.sif allows you to specify files that are parsed and instered into the registry at install time. Insert the following in the [HiveInfs.Fresh] section:

```
        [HiveInfs.Fresh]
        AddReg = hivedef.inf,AddReg
        AddReg = hivesys.inf,AddReg
        AddReg = hivesft.inf,AddReg
        AddReg = hivecls.inf,AddReg
        AddReg = hiveusd.inf,AddReg
        AddReg = dmreg.inf,DM.AddReg
        AddReg = usbboot.inf,usbservices
```

and also in [SourceDisksFiles]

```
        [SourceDisksFiles]
        usbboot.inf = 1,,,,,,,_x,3,,3
        bootvid.dll = 1,,,,,,,3_,2,0,0,,1,2
        kdcom.dll = 1,,,,,,,3_,2,0,0,,1,2
```

Finally, save and close **TXTSETUP.SIF**. We are done with it.

6-B) DOSNET.INF

Now, open **DOSNET.INF** , and change the second [Files] section to look like this:

```
[Files]
d1,usbboot.inf
d1,_default.pif
d1,12520437.cpx
d1,12520850.cpx
```

....

6-C) usb.inf

Change the bolded lines in the [StandardHub.AddService] and [CommonClassParent.AddService] sections:

[StandardHub.AddService]
DisplayName = %StandardHub.SvcDesc%
ServiceType = 1 ; SERVICE_KERNEL_DRIVER
StartType = 0 ; SERVICE_DEMAND_START
ErrorControl = 1 ; SERVICE_ERROR_NORMAL
ServiceBinary = %12%\usbhub.sys
LoadOrderGroup = Boot Bus Extender

[CommonClassParent.AddService]
DisplayName = %GenericParent.SvcDesc%
ServiceType = 1 ; SERVICE_KERNEL_DRIVER
StartType = 0 ; SERVICE_DEMAND_START
ErrorControl = 1 ; SERVICE_ERROR_NORMAL
ServiceBinary = %12%\usbccgp.sys
LoadOrderGroup = Boot Bus Extender

6-D) usbport.inf

Change the bolded lines in the [EHCI.AddService], [OHCI.AddService] , [UHCI.AddService] and [ROOTHUB.AddService] sections:

[EHCI.AddService]
DisplayName = %EHCIMP.SvcDesc%
ServiceType = 1 ; SERVICE_KERNEL_DRIVER
StartType = 0 ; SERVICE_DEMAND_START
ErrorControl = 1 ; SERVICE_ERROR_NORMAL
ServiceBinary = %12%\usbehci.sys
LoadOrderGroup = Boot Bus Extender

[OHCI.AddService]
DisplayName = %OHCIMP.SvcDesc%
ServiceType = 1 ; SERVICE_KERNEL_DRIVER
StartType = 0 ; SERVICE_DEMAND_START
ErrorControl = 1 ; SERVICE_ERROR_NORMAL
ServiceBinary = %12%\usbohci.sys
LoadOrderGroup = Boot Bus Extender

[UHCI.AddService]
DisplayName = %UHCIMP.SvcDesc%
ServiceType = 1 ; SERVICE_KERNEL_DRIVER
StartType = 0 ; SERVICE_DEMAND_START
ErrorControl = 1 ; SERVICE_ERROR_NORMAL
ServiceBinary = %12%\usbuhci.sys
LoadOrderGroup = Boot Bus Extender

[ROOTHUB.AddService]
DisplayName = %ROOTHUB.SvcDesc%
ServiceType = 1 ; SERVICE_KERNEL_DRIVER
StartType = 0 ; SERVICE_DEMAND_START
ErrorControl = 1 ; SERVICE_ERROR_NORMAL
ServiceBinary = %12%\usbhub.sys
LoadOrderGroup = Boot Bus Extender

6-E) usbstor.inf

Change / Add the bolded lines in the [USBSTOR.AddService] section

[USBSTOR.AddService]
DisplayName = %USBSTOR.SvcDesc%
ServiceType = 1
StartType = 0
Tag = 3
ErrorControl = 1
ServiceBinary = %12%\USBSTOR.SYS
LoadOrderGroup = Boot Bus Extender

6-F) new file: USBBOOT.INF

Create a new file called USBBOOT.INF in the same directory as your other changed files, and put the following content into it:

[usbservices]

HKLM,"SYSTEM\CurrentControlSet\Services\USBSTOR","DisplayName",0x00000000,"USB Mass Storage Driver"
HKLM,"SYSTEM\CurrentControlSet\Services\USBSTOR","ErrorControl",0x00010001,1
HKLM,"SYSTEM\CurrentControlSet\Services\USBSTOR","Group",0x00000000,"System Reserved"
HKLM,"SYSTEM\CurrentControlSet\Services\USBSTOR","ImagePath",0x00020000,"system32\DRIVERS\USBSTOR.SYS"
HKLM,"SYSTEM\CurrentControlSet\Services\USBSTOR","Start",0x00010001,0
HKLM,"SYSTEM\CurrentControlSet\Services\USBSTOR","Type",0x00010001,1

HKLM,"SYSTEM\CurrentControlSet\Services\usbehci","DisplayName",0x00000000,"USB 2.0 Enhanced Host Controller Miniport Driver"
HKLM,"SYSTEM\CurrentControlSet\Services\usbehci","ErrorControl",0x00010001,1
HKLM,"SYSTEM\CurrentControlSet\Services\usbehci","Group",0x00000000,"System Reserved"
HKLM,"SYSTEM\CurrentControlSet\Services\usbehci","ImagePath",0x00020000,"system32\DRIVERS\usbehci.sys"
HKLM,"SYSTEM\CurrentControlSet\Services\usbehci","Start",0x00010001,0
HKLM,"SYSTEM\CurrentControlSet\Services\usbehci","Type",0x00010001,1

HKLM,"SYSTEM\CurrentControlSet\Services\usbhub","DisplayName",0x00000000,"USB2 Enabled Hub"
HKLM,"SYSTEM\CurrentControlSet\Services\usbhub","ErrorControl",0x00010001,1
HKLM,"SYSTEM\CurrentControlSet\Services\usbhub","Group",0x00000000,"System Reserved"
HKLM,"SYSTEM\CurrentControlSet\Services\usbhub","ImagePath",0x00020000,"system32\DRIVERS\usbhub.sys"
HKLM,"SYSTEM\CurrentControlSet\Services\usbhub","Start",0x00010001,0
HKLM,"SYSTEM\CurrentControlSet\Services\usbhub","Type",0x00010001,1

HKLM,"SYSTEM\CurrentControlSet\Services\usbuhci","DisplayName",0x00000000,"Microsoft USB Universal Host Controller Miniport Driver"
HKLM,"SYSTEM\CurrentControlSet\Services\usbuhci","ErrorControl",0x00010001,1
HKLM,"SYSTEM\CurrentControlSet\Services\usbuhci","Group",0x00000000,"System Reserved"
HKLM,"SYSTEM\CurrentControlSet\Services\usbuhci","ImagePath",0x00020000,"system32\DRIVERS\usbuhci.sys"
HKLM,"SYSTEM\CurrentControlSet\Services\usbuhci","Start",0x00010001,0
HKLM,"SYSTEM\CurrentControlSet\Services\usbuhci","Type",0x00010001,1

HKLM,"SYSTEM\CurrentControlSet\Services\usbohci","DisplayName",0x00000000,"Microsoft USB Open Host Controller Miniport Driver"
HKLM,"SYSTEM\CurrentControlSet\Services\usbohci","ErrorControl",0x00010001,1
HKLM,"SYSTEM\CurrentControlSet\Services\usbohci","Group",0x00000000,"System Reserved"
HKLM,"SYSTEM\CurrentControlSet\Services\usbohci","ImagePath",0x00020000,"system32\DRIVERS\usbohci.sys"
HKLM,"SYSTEM\CurrentControlSet\Services\usbohci","Start",0x00010001,0
HKLM,"SYSTEM\CurrentControlSet\Services\usbohci","Type",0x00010001,1

7) Repack the inf files into their original IN_ format

If you have not already deleted your extracted .IN_ files, do so now. They need to be replaced. Open a DOS shell again, and navigate to the folder with your changed files. Then exceute the following commands:

cabarc n USB.IN_ usb.inf
cabarc n USBPORT.IN_ usbport.inf
cabarc n USBSTOR.IN_ usbstor.inf

The three IN_ files should now exist again.

Congratulations. All out modifications are done.

8) Inject the changed files into the ISO

Open your Windows CD image again with WinISO. Navigate to the I386 folder, and **delete** the following files from the ISO, saving the changes to the ISO afterwards:

- DOSNET.INF
- TXTSETUP.SIF
- USB.IN_
- USBPORT.IN_
- USBSTOR.IN_

Just to be sure all is updated in the ISO, cloase and repoen the ISO in WinISO. Now, again go to the I386 folder and select "Add Files". Now add your changed files, in detail:

- USBBOOT.INF
- DOSNET.INF
- TXTSETUP.SIF
- USB.IN_
- USBPORT.IN_
- USBSTOR.IN_

Save the ISO. You are done.

9) Burn the ISO back to CD

Feel free to use any burning package you want. I used the free and simple [Burnatonce](#)

10) Install Windows XP from the CD

Shut down your computer. Disconnect ANY internal and external hard drives (so Windows cannot find them during installation and mess up their Master Boot Records hehe). Some computers will have trouble to boot without an internal HDD attached, check in your BIOS and, if possible, remove the HDD from the boot sequence and set the USB Harddisk as the first boot device, and the CDROM as second.

Also, now connect your USB Harddrive directly to the computer, **without any Hubs in between.**

Windows should install just fine, with the exceptions noted below.

Issues you will encounter during installation:

- During driver installation, the USB drivers will prompt you, as they are "not certified" - This is normal. Our changes invalidated the checksum, and therefore the driver is no longer signed. Just press "yes" a couple of times.
- Upon completion of the install, the system will complain once on the first bootup that the pagefile does not exist. You can ignore this for now, as Windows will work fine without it. People are looking at fixing this issue, but its not critical for now.

Once everything is up and running , shut down and reconnect all your drives.

This version of the guide has been tested successfully on the follwoing hardware configurations - please [email me](#) your infos if you have successfully completed the guide, so I can add your configuration as well:

If you have troubles, please visit the [forum](#) dedicated to this tutorial.

have a lot of fun!

Emanuel Schleussinger
http://www.ngine.de

(Tags: windows)

© 2002-2008 Emanuel Schleussinger. Built with InfoStore and Wicket