Multibooters - Dual/Multi Booting With Vista

Cloning Vista

**Possible partition issues - Preparing the BCD.
Curing drive letter allocation problems.
Fix the BCD while working from another OS or the Vista DVD.
Hibernation issues - Backup the BCD - Whole drive cloning.**

Cloning

Vista is similar enough to previous versions of the NT operating system
that many cloning tools that worked with 2K/XP/2K3 can be used for Vista.
The problems arise mostly from the new Vista boot files bootmgr and
BCD, the way they use the Disk Signature, and the new Vista partitioning
rules. If these factors are taken into account and adjusted for then many
current cloning or imaging tools are perfectly capable of working with
Vista. Of course most cannot be installed inside Vista, but they can be run
from another OS or boot disk. Third party vendors of such tools are
releasing Vista compatible versions, but some still have issues that have
not been fully addressed.

Cloning any WinNT OS requires adherence to certain rules to get a clean
booting and independent clone that is not in some way cross-linked with
the parent install. When using the Microsoft bootmanager with its reliance
on separate system and boot partitions and non-default drive letters there
are extra variables that can make successful cloning more tricky. I have
tried to provide some information relevant to the MS bootmanager, but
please be aware that the information here is mainly aimed at systems
where the Windows installs are independent with all their boot files on
there own partition and see themselves as the C: drive and their partition
as both system and boot. If you don't know what I mean by 'independent',
or you are using the MS bootmanager and don't understand how it works,
then you should read this page before attempting to multiboot clones.

Off Boundary Partitions
The first and most potentially troublesome issue to be aware of is that
Vista created partitions are different, so many pre-Vista cloning tools will
either just not recognise them as valid partitions, or worse still try and

correct what they see as errors. If you have allowed Vista to create its own partition during install, or used any Vista tools such as Disk Management or Diskpart to create or resize any of the partitions on the computer, then you would be advised to be extremely cautious in using a pre-Vista cloning, imaging or partitioning tool. Not all tools will baulk at the Vista partitions and some will clone and image them, but none will keep the structure of the Vista partition for the newly created clone or restored image, (unless you are doing a whole drive sector-by-sector clone, see section below). Powerquest's Drive Image and Partition Magic will *not* work with Vista partitions and their attempts to 'repair' things will damage Vista. As long as all partitions on the computer are old style then you have at least a fair chance of success, but more importantly you have much less of a chance that you will do any damage. If your cloning tool seems happy working with a Vista OS and goes to work without reporting any errors, then you should be ok.

Winload.exe........Is Missing

After successful cloning you will still be unable to boot the clone unless the Vista BCD file is pointing to the correct new location of the Vista bootloader. It's very similar to how the boot.ini file has to be edited to point to the new partition or drive, but unlike the boot.ini you can't just edit the BCD in Notepad. Correcting the BCD in clones is possible and not particularly difficult, but it is more of a hassle than opening Notepad and changing a digit or two. What would be ideal is if the BCD could be made to just point to the winload.exe that was on the same partition as itself. This would allow a new clone to boot without having to make any corrections to the BCD.

Fortunately there is a way to do this and it makes cloning Vista almost easier than any previous NT operating system. Credit for this edit to the BCD goes to the man who worked it out. It's still not exactly clear what happens in the Vista bootmgr when this edit has been applied, but it has been used by a lot of people for more than a year with no reports of any problems or issues. It is not a published Microsoft fix, but it appears to be exactly the same edit as applied by Microsoft's own sysprep utility. The sysprep tool is designed to allow computer suppliers and IT pros to easily deploy Vista to numerous computers, by letting them install Vista once and then copy it to the other machines. That single install has to be 'generalized' so that when it is rebooted for the first time on another machine it is able to adapt to its new surroundings. My examinations of the 'generalized' BCD of a syspreped Vista install has shown that it employs the same edit as described here. If it's how Microsoft do it, then I think we can be fairly confident that it is a valid approach. If you don't want to generalize a BCD but just reset one to its new surroundings, then see the section below *Re-Specialize a BCD.*

To make this change to the BCD you have to use the command line bcdedit.exe tool and you have to be very careful you are working on the correct BCD and the correct boot entry. If you are using a third-party bootmanager and have other Vista installs on the computer then you will

have more than one BCD and so bcdedit.exe could be working on the wrong one. If you are using the MS bootmanager then you will have more than one boot entry (Object) active in the BCD and so the {default} identifier might not be correct for your set up. Using the {default} identifier means you will alter the Object set as the default item in the MS bootmanager, that's the one that will start automatically if you don't make a booting choice before the bootmenu timeout. When running bcdedit.exe from inside Windows the {current} identifier will normally alter the Object of the OS that is currently booted, but this is not always true for those of us using third-party bootmanagers and running clones. If bcdedit.exe is working on the wrong BCD then the {current} identifier might still change an Object in a BCD other than the one inside the OS we are booted into. It will depend on whether the bootmanager being used is fully compatible for Vista on second or higher hard drives and logical partitions. If you don't know for sure that yours is, then you should always check that bcdedit.exe is indeed targeting the BCD you intended. See BCD is Always Open

If you *do not* have the MS bootmanager configured and the Vista you want to generalize is on a primary partition on the boot hard drive, then the easiest way to apply this change to its BCD is to boot into that OS and open a command prompt window, (how to do it from another OS or the Vista DVD is covered below). You might have to open the command prompt with elevated privileges by right clicking and choosing 'Run as administrator' then just type these separate commands, pressing Enter after each one. You should get a message after each. "The operation completed successfully" If you get any other message from the first line then something is wrong with your set up and you are either not in a boot drive primary, or you might have the MS bootmanager configured. Remember that not getting an error is no guarantee that you are not changing the wrong BCD. Using the {default} identifier in the first two commands here would work equally as well, except you would have no chance of getting an error message if you were changing the BCD in a different install. (*If you do have trouble targeting the correct BCD then you can point bcdedit.exe to the desired BCD with the commands shown in the section below **Generalize a BCD While Working From a Different OS***).

bcdedit /set {current} osdevice boot
bcdedit /set {current} device boot
bcdedit /set {bootmgr} device boot
bcdedit /set {memdiag} device boot

The memdiag line shown here is optional and only required if you ever want to use Vista's boot time memory tester. There should be one space between each block of characters. Once you have applied the first command you can use the up and down arrow keys to scroll through the previous commands you have entered, then back-arrow and edit, instead of re-typing much of the same again. Or you can copy and past from this page.

Now no matter which partition or drive on that computer you clone this Vista install to it will boot without any further modifications (assuming you are using a [Vista compatible bootmanager](http://www.multibooters.co.uk/cloning.html)). The parent Vista will continue to function normally and I have yet to find a reason to return its BCD to the original condition. If you do restore the BCD then you will have to generalize it again before future cloning operations. You will also be more prone to boot problems if anything changes the hard drive disk signature or the partition offset. It's only when using the MS bootmanager that the BCD might have to point to a winload.exe that is not on the same partition as itself. When you are using a third-party bootmanager the BCD always needs to point to its own partition, so there is no need for specific drive and partition information. In fact this is also true if you only have one Windows, so why didn't MS make this the default behavior until such time as the bootmanager was configured? Perhaps there is a reason yet to be discovered. Microsoft's sysprep tool does re-specialize the BCD during first boot of a generalized Vista.

If you do want to 'un-generalize' your original BCD, or the one in the new clone, then see the section below *Re-specialize a BCD*. Or you could make a backup of your original BCD before you start so that you can restore it after cloning. If you can't do this from another OS or boot disk then it can be done from within the OS with bcdedit.exe and this is covered below in the section *Backup and Restore a BCD with bcdedit.exe*. If you also keep a backup of the generalized BCD then it can be use to replace the BCD in any future clones you make, although it will mean an extra step before you can boot the clone for the first time. A generalized BCD can also be used to replace the one in any Vista install on any computer that is proclaiming 'winload.exe......is missing or corrupt'.

Other BCD boot Objects
The Vista resume loader that restarts the system from hibernation also has its own boot Object in the BCD store, but it follows the lead of the operating system Object, so on reboot of the parent Vista and first boot of the clone they will be automatically set for you. This is however dependent on hibernation being turned on in Vista and so it will not happen if hibernation has been completely turned off. If you are having trouble with hibernation or hybrid sleep then it is more likely because of a particular issue with third-party bootmanagers that are not fully Vista compatible. There's more about this below in the section *Manually set the Hibernation Object* and full details here [BCD is Always Open](http://www.multibooters.co.uk/cloning.html)

If you think you might ever what to use the clone in a dual/multiboot arrangement using the MS bootmanager, (?) then you can add this next command. Only necessary if the clone is going to be the System partition and you will have legacy Windows OSes. You don't have to run this command before you clone. It can be done any time later using bcdedit.exe from inside the new clone.
bcdedit /set {ntldr} device boot

Curiously the Vista sysprep tool does not re-specialize the {ntldr} object correctly. Perhaps MS figured that because you can't natively install XP after Vista then there was no need, however it is not difficult to add XP yourself and get it working. So if you have a machine that came with Vista pre-installed and you tried adding XP and all you got was ***ntldr......is missing or corrupt***, then this may be why.

Drive Letter Problems

In most previous WinNT operating systems you can have problems with clones when they do not correctly see themselves as the same drive letter as the parent does. This usually results in major issues and cross-linked installs where files from both the parent and the clone will be used during bootup. The cause of this problem is the way WinNT remembers drive letters and stores this information in its registry. When the clone boots it will look at its cloned registry and often be more than slightly inclined to retain the drive letters that the parent had assigned to partitions. This is obviously a problem if you need the clone to assign a different drive letter to a partition, particularly its own. If the parent saw itself as the C: drive then the clone will also have to see itself as the C: drive.

With Vista I have found that in most cases it will by itself completely and automatically adapt and make its new partition the drive letter that it needs to be, regardless of whether the parent or any other partition is hidden or not. I'm only getting a few exceptions to this and mainly only for logical partitions on second or higher hard drives and I'm still trying to tie down the exact variables responsible. If you are having problems with drive letters in clones then the complete solution appears to be only that you need a bootmanager that is fully Vista compatible and able to drive swap correctly for second of higher hard drives and set the Active partition as required for logical partitions.

If you do have a problem with a clone assigning itself the wrong drive letter then you will still be able to boot Vista by clicking through various dll errors and eventually get to a limited desktop, or in some cases just to a completely blank light blue screen. In previous WinNT recovering the OS from this situation could be difficult, but in Vista it is relatively easy and can be done from the loaded desktop. All you have to do is change the drive letter to what it needs to be. Once you reach the limited desktop press ***Ctrl+Shift+Esc*** or ***Ctrl+Alt+Del*** to open Task Manager and then click 'new task...' and run **compmgmt.msc** and once the console opens select Disk Management from the list of utilities and then determine what drive letter has been assigned to your clone. Then 'new task ...' again and this time run **regedit** and navigate to the key described in the screenshot below. Right click on the \DosDevices\ entry that has the letter currently assigned to the clone and choose 'rename' and change the letter to the one the parent sees itself as when you are booted into it. If your clone's registry already has that letter assigned to another DosDevices entry you will need to change that one first to free up the required letter. You can make it anything for now as you can change it again later in Disk Management.

If you don't get a limited desktop but only the blank blue screen then you probably won't be able to open Disk Management, but regedit should still work. You can make an educated guess to which entry is the clone and change its letter and try rebooting. Repeat if necessary with all the entries until you get the right one. Or you could just delete all entries and let Windows completely rebuild the list on reboot. This may do the job, or just take you back to where you started. Completely clearing the drive letter list is a useful trick in XP based operating systems to cure drive letter problems, (for 2K OSes there are other factors that can make it hazardous). It does have its risks however and should not be attempted lightly for anything other than boot drive primary partitions. For second or higher hard drives or logical partitions, or if you are using the MS bootmanager, you should use with caution or know what you are doing. For Vista OSes that are already having problems then you have little to loose and should still be able to recovered with the procedures described here.

Sometimes the list in MountedDevices can become very long with many old and defunct entries, particularly after cloning. Occasionally this can cause a problem with letter allocation for removable USB devices, so clearing the list just for this reason can be useful. For boot drive primary partitions this requires no precautions other than not having the MS bootmanager configured and the OS seeing itself as the C: drive and both the System and Boot partition. For other hard drives or logical partitions then additional conditions need to be correct if you are not then going to give yourself problems. With Vista it will just take a fully compatible bootmanager that drive swaps correctly and sets the Active partition to the one you are booted into. You should then be able to clear MountedDevices completely and reboot with no problems, then reset your optical drives etc. and any data partitions to the desired letters.

Unless you really know what you are doing you should only clear the mounted devices in boot hard drive primary partitions that see themselves as the C: drive and as both the System and Boot partition.
Delete all entries in the MountedDevices folder - except the first default entry.
Or alternatively just delete the whole key, as it will be regenerated on reboot.
HKEY_LOCAL_MACHINE\SYSTEM\MountedDevices
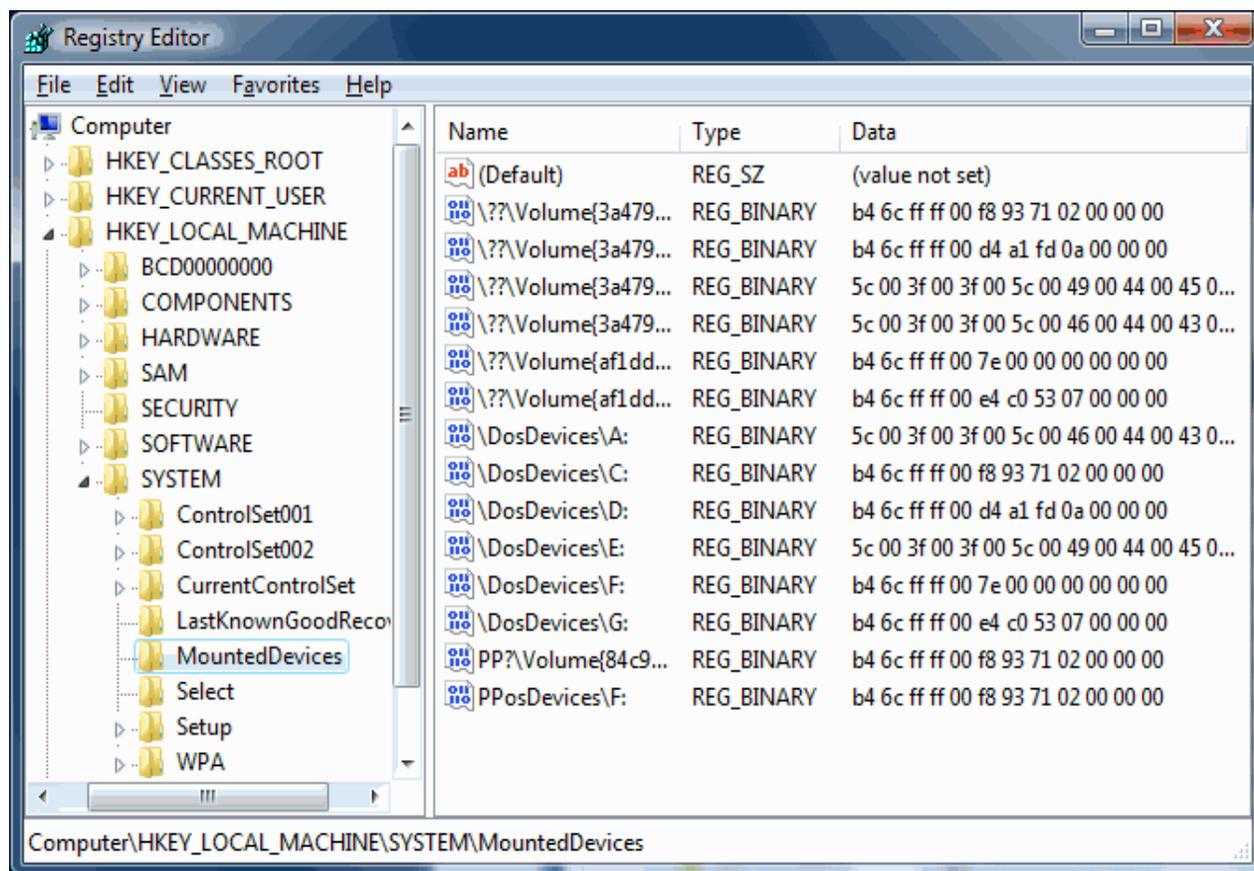
The amount of entries in MountedDevices can range from a handful like above, to dozens.

Don't Be Fooled

If you try to boot a moved clone of 2K/XP without editing the boot.ini file then it would appear like you were indeed booting into the clone when in fact you were actually booting into the parent that the boot.ini was still pointing to. The same happens with a clone of Vista if the BCD file is not altered correctly. It will look like you have successfully booted the clone when in fact it will be the parent install of Vista that will be booted. Look in Disk Management and you will see the real System and Boot partitions. Hiding the parent when booting the clone does not help as the parent will still be targeted. You will then get an *Autochk Program not Found* or a blue screen error part way into the attempted boot of the hidden Vista. If the Disk Management utility shows the system and boot partitions as expected, but the drive letter as seen from inside the new clone is not the same as it is inside the parent, then you have cross-linked OSes. Move some icons on the desktop and then boot into the parent, if the changes are there as well then you know you have a problem. Another good test is to install a new program in one and then look and see if it appears in the Add/Remove list of the other.

Generalize a BCD While Working From a Different OS

When bcdedit.exe is run it will by default modify the BCD on what it sees as the System partition, see BCD is Always Open. It is possible however to direct bcdedit.exe to work on any BCD on any partition or drive – even logical partitions. The easiest way to achieve this is to allow the partition with the BCD you want to change to be seen by the Windows OS you are booted into and so be assigned a drive letter, then prefix every command with the path to the desired BCD. So if for example your target BCD is on drive E: and it is where expected in the boot folder in the root of that partition, then the prefix will be **/store E:\boot\bcd** If you type just **bcdedit** at the command prompt you will be shown the contents of the system partition BCD, if there is one. If you type **bcdedit /store E:\boot\bcd** you will be shown the contents of the BCD on the E: drive.

Now an important thing to understand is that the BCD does not hold any record what-so-ever of drive letters that are allocated to any OS or partition. It is bcdedit.exe itself that will put drive letters into the displayed contents of the BCD. The BCD identifies partitions by their offset, and bcdedit.exe will simply put a drive letter in there to make it easy for you to see what partition that is. It shows you the drive letter that the Windows OS you are booted into has given to that partition. So, do not be concerned that drive letters displayed by bcdedit.exe do not seem to relate to the drive letter that an OS considers itself to be.

So to 'generalize' your desired BCD you need to use these commands, replacing the X with the drive letter of the partition the target BCD is on. You have to use the {default} identifier here because this was not the BCD that was used to boot the OS that you are currently in. *(If you have the MS bootmanager configured for dual/multiboot in the OS on the target partition then remember that the* {default} *identifier will change the default OS. If you have made that a legacy Windows then the first line here is not applicable to the ntldr and so will give you an error. The second line will change the ntldr Object, not Vista's).*

bcdedit /store X:\boot\bcd /set {default} osdevice boot
bcdedit /store X:\boot\bcd /set {default} device boot
bcdedit /store X:\boot\bcd /set {bootmgr} device boot
bcdedit /store X:\boot\bcd /set {memdiag} device boot

The commands don't have to be entered in the order displayed here, it is just the order that gives you some error control as well as giving you the least amount of editing to the next line if you use the up-arrow key to paste in the previous command.

The ntldr line can also be included if required.
bcdedit /store X:\boot\bcd /set {ntldr} device boot

If you do have the MS bootmanager active on the target partition and you can't change the default item in its bootmenu to make the first two commands work for you, then you can still proceed by using the specific GUID for the Vista install. To discover the GUID enter this command **bcdedit /store X:\boot\bcd /v** to see the contents of the BCD store. The GUID you want is the 'identifier' for the 'Windows Boot Loader' object. (*If the Vista install is on a different partition to the BCD you are editing then you cannot generalize its object. It will need to be re-specialized*).
bcdedit /store X:\boot\bcd /set {xxxxxxxx-your-guid-here-xxxxxxxxxxxx} osdevice boot
bcdedit /store X:\boot\bcd /set {xxxxxxxx-your-guid-here-xxxxxxxxxxxx} device boot

If you are working from a pre-Vista OS then you obviously won't have bcdedit.exe inside that version of Windows. The easiest solution is to take a copy of it from the system32 folder of the Vista install and place it inside the system32 folder of the OS you are working from. Or you can just tell the command prompt you are running to use the bcdedit.exe where it is in the other OS, but this will require another prefix to all your commands.
X:\Windows\system32 where X is the drive letter of the OS where bcdedit.exe is. Most likely this will be the same drive as the BCD store you are editing, so both Xs in the commands will be the same.
X:\Windows\system32\bcdedit /store X:\boot\bcd /set {default} osdevice boot
X:\Windows\system32\bcdedit /store X:\boot\bcd /set {default} device boot
X:\Windows\system32\bcdedit /store X:\boot\bcd /set {bootmgr} device boot
X:\Windows\system32\bcdedit /store X:\boot\bcd /set {memdiag} device boot
X:\Windows\system32\bcdedit /store X:\boot\bcd /set {ntldr} device boot

Generalize a BCD From The Vista DVD

If you are using the MS bootmanager and want to add other OSes to its bootmenu then you can use the DVD auto repair feature or the bootrec.exe tool, which if you just have a standard and simple set up can sometimes work quite well. This won't generalize your BCD but fix it in the standard 'Specialized' form. If on the other hand you have independent installs of Windows and a third-party bootmanager then the auto repair is best avoided as it will try to configure the

MS bootmanager and could make a complete mess of your system. If you are not trying to generalize a BCD but just fix the one in an independent clone then the bootrec tool can be used for primary partitions on the boot hard drive. Set the target partition as the Active one on the disk before you start and then once at the DVD command prompt run **bootrec /rebuildbcd** and of the Windows installs it finds and offers to add to the BCD accept only the C: drive, as that is the letter the DVD will see the Active partition as. This will make a new specialized BCD in the clone, but it might be lacking some of the other boot Objects like {ntldr}, {memdiag} and the debug options.

To generalize any desired BCD we need to get to a command prompt and run bcdedit.exe. There are two ways to reach a command prompt from the DVD and one involves going past the auto repair feature. When you get to the "Install now" screen you will see the 'Repair your computer' option in the lower left, if you select this the auto repair will most likely scan the machine and offer to fix the problems it has found. You want to be careful to decline and click No and then click Next to go to a list of options, one of which will be the command prompt. Rather than go through the auto repair and risk clicking the wrong button, continue with the install as normal by clicking 'Install Now' and at the very next screen where you are asked to enter your product code press Shift+F10 and the command prompt will open.

Now the first thing to do is determine what drive letter the DVD considers your target partition to be. Again this may bear no relation to any drive letters Windows has assigned. Type **diskpart** and you will go to the DISKPART> prompt. Enter **list volume** and you will get a list of all the partitions (or volumes) on every drive, but only those partitions that are not hidden, so you have to make sure your target partition is un-hidden before you boot from the DVD. You should get a list of all accessible partitions with a drive letter assigned to each.

```
Administrator:X:\windows\system32\cmd.exe                               _ □ X

X:\sources>diskpart

Microsoft DiskPart version 6.0.6000
Copyright (C) 1999-2007 Microsoft Corporation.
On computer: MINWINPC

DISKPART> list volume

  Volume ###  Ltr  Label        Fs     Type        Size     Status     Info
  ----------  ---  -----------  -----  ----------  -------  ---------  --------
  Volume 0     I   LRMCFRE_EN_  UDF    DVD-ROM     2555 MB  Healthy
  Volume 1     J   XP-MEDIA     NTFS   Partition   4001 MB  Healthy
  Volume 2     M   DATA1        NTFS   Partition    141 GB  Healthy
  Volume 3     D   XP-Pro       NTFS   Partition     10 GB  Healthy
  Volume 4     C   VISTA        NTFS   Partition     20 GB  Healthy
  Volume 5     E   VISTA        NTFS   Partition     20 GB  Healthy
  Volume 6     F   WINXP-L4     NTFS   Partition   4001 MB  Healthy
  Volume 7     H                NTFS   Partition     39 GB  Healthy
  Volume 8     K   XP-Pro       NTFS   Partition   6001 MB  Healthy
  Volume 9     L                NTFS   Partition     39 GB  Healthy
  Volume 10        Data2        NTFS   Partition    382 GB  Healthy

DISKPART> exit

Leaving DiskPart...

X:\Sources>
```

The only sure way to identify your partition is by its size or its volume label, so if you don't think size will be enough then make sure it has a unique label. This is displayed in Windows next to the drive icon in My Computer and will just say (Local Disk) if no volume label has been set. Right click on the drive icon and choose 'Rename' and change it to something unique. (**Warning for Win2K users**: never change the Volume Label of a 2K operating system other than from inside that OS). Once you have determined your drive letter from diskpart then exit by typing **exit** and when back at the **X:\Sources>** prompt, the commands to generalize the BCD are the first group shown in the section directly above this one - *Generalize a BCD While Working From a Different OS*

Re-Specialize a BCD

If you want to change a generalized BCD back to a specialized one, or just repair one so that it is specialized for its new surroundings, then it only takes replacing the 'boot' component in the bcdedit.exe commands with specific partition drive letters. To fully un-generalize a BCD of an independent Vista that you are booted into then you need these five commands, where X is the drive letter that the OS sees itself as. An error from the first two commands here will tell you that there is something wrong with your set up and you are not working on the BCD or the Object you think you are. But remember that the absence of an error message is not a guarantee that you have got things correct. If you have not yet read the beginning of this page you should do so before proceeding.

bcdedit /set {current} osdevice partition=X:
bcdedit /set {current} device partition=X:
bcdedit /set {bootmgr} device partition=X:
bcdedit /set {memdiag} device partition=X:
bcdedit /set {ntldr} device partition=X:

To specialize a BCD while working from another OS or the DVD your commands will be as follows, where the drive letter of the partition is the same as the drive letter in the path to the BCD. That is both Xs have the same value. *(These are also the commands you would use from inside an OS if you were having trouble getting bcdedit.exe to target the OS's own BCD).*

bcdedit /store X:\boot\bcd /set {default}
osdevice partition=X:
bcdedit /store X:\boot\bcd /set {default}

device partition=X:
bcdedit /store X:\boot\bcd /set {bootmgr}
device partition=X:
bcdedit /store X:\boot\bcd /set {memdiag} device
partition=X:
bcdedit /store X:\boot\bcd /set {ntldr} device partition=X:

Remember, you are not setting drive letters in the BCD, you are simply telling bcdedit.exe which partition you mean, in this case you mean the partition the Vista install is on. If you have the MS bootmanager configured in the BCD in the target OS and your Vista install is on a different partition to that BCD then the first two commands above will require the specific GUID for your Vista and not the {default} identifier. The value of each X will also be different, the first being the BCD's partition drive letter and the second being Vista's partition drive letter.

Manually Set Hibernation Object

If you do have trouble with the resume object correctly resetting or just want to do it yourself then here is the command. First make sure that hibernation is indeed turned on as described at the bottom of this section. There is no shorthand identifier for this one so you have to use the full 32 digit GUID number. Run **bcdedit /enum all** and the GUID you want is the 'Identifier' for the Resume from Hibernation object. You will almost certainly be doing this from inside the OS you are having trouble with so it will be possible to copy and paste the GUID instead of having to type it out. To copy from the command prompt window right click anywhere and click 'Select All' and press Enter and this should copy to the clipboard, but not always first time so you may have to try again. Paste into Notepad or whatever and then copy just the required GUID and paste back into your command line.

If your BCD is generalized then the command will be:
bcdedit /set {xxxxxxxx-your-guid-here-xxxx-xxxxxxxx} device boot

If the BCD is Specialized then it is this, where X is Vista's own drive letter.
bcdedit /set {xxxxxxxx-your-guid-here-xxxx-xxxxxxxx} device
partition=X:

Once hibernation has been used for the first time a new line (Element) called 'resumeobject' will appear in the bootmgr Object, and also a new one called 'filedevice' in the resume Object. The filedevice Element in the resume Object uses the signature and offset information and so has to be set correctly, but we never have to do this one ourselves because it is

inspected and reset if required every time hibernation is used. It is always specialized, so there would be no point in generalizing it.

It is this auto specializing of the filedevice Element just before hibernation shuts the system down that is part of the cause of hibernation or hybrid sleep problems in independent Vista's on second or higher hard drives or logical partitions. If your bootmanager is not fully Vista compatible then the wrong BCD store can be set for resume, see <u>BCD is Always Open</u>. If you do want hibernation to function in independent Vista installs on anything other than boot drive primary partitions, then I have found no solution other than making sure your bootmanager is fully Vista compatible. The new '<u>Hybrid Sleep</u>' in Vista also uses the hibernation function and so partly suffers from the same problem. It appears hybrid sleep is hardware dependent so it may not be available as an option on slightly older machines. If you do have it turned on then you will not have hibernation as an option on your shutdown menu. You have to set hybrid sleep to Off before hibernate will be available.

Turing Hibernation On and Off

By default the hibernation feature should be on and you can check if it is by looking to see if you have the hibernation file *hiberfil.sys* in the root of your install (it is hidden by default remember). If it's not there then hibernation is off and so the resume object device element will not auto reset itself on bootup. To turn it on at the command line enter **powercfg /h on** to turn it off **powercfg /h off** The hiberfil.sys file can show as a couple of gigs in size even when it's not being used, so if you don't use hibernation or hybrid sleep then you can get rid of this file by turning hibernation off.

Backup and Restore a BCD with bcdedit.exe

If you want to create a backup of a BCD from inside the Vista OS that is holding it open, then the command will be as follows – where **X:\folder** is the target drive and folder where the back-up will be saved to.

bcdedit /export X:\folder\bcd
To restore the BCD from your back-up
bcdedit /import X:\folder\bcd

If for example you create a new folder in the root of the C: partition and call it boot2, then the path would be **C:\boot2**. If you want to send the BCD backup to your documents folder on the C: drive then the whole

command would be **bcdedit /export
C:\users\yourname\documents\bcd**. If you include any spaces in the
folder name or the name you give to the BCD back-up file you have to
enclose the path and file name in quotation marks: e.g. **bcdedit /export
"C:\boot2\bcd bkup"**

Whole drive sector-by-sector cloning

If you make a complete sector-by-sector clone of a drive containing Vista
then you will duplicate the disk signature and the partition offset and so
you will not have to modify the BCD to get Vista booting, because it will
already contain the correct information. Be aware however that you
cannot have two hard drives on the same computer with identical disk
signatures. If you boot any WinNT operating system when there are
two drives with the same signature then one of the signatures will be
automatically changed. If you do clone a Vista drive in this way and need
both drives connected at the same time then generalizing the BCD before
cloning, or re-specializing or generalizing the BCD on the affected drive,
will fix the problem. This has always been an issue when cloning entire
hard drives containing WinNT, but before Vista a signature change could
in many cases not cause an issue and so may have went unnoticed.

Cloning Vista for anything other than backup or recovery purposes may violate your EULA

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