

Hardisk Cloning

This method uses software to make an exact bit-by-bit mirror image of everything on the old operating system hard drive so it can be transferred to a new hard drive. Once this process is complete, you simply swap the new drive for the old one and you have a newer, faster disk with exactly the same contents as before (and some additional empty space if it was a larger disk).

While this method is incredibly useful for moving your WindowsXP installation around to different disks on the same computer, it can also be used to move WindowsXP to a new computer with a different configuration if you are upgrading the entire box from say a Intel Pentium III to a Pentium Pentium4.

How disk cloning works

Disk cloning uses a special software program such as Symantec's Norton Ghost to create an exact copy of one hard disk on a second drive. This does not involve copying files as such. Rather, the software creates an "image file" of the drive's contents which is then applied to a new hard drive, or stored elsewhere.

Many disk cloning software packages allow for a disk image to be stored on another type of media such as magnetic tape, DVD-R, CDR/RW, or kept in a central location to be cloned to many computers via a network. Most disk cloning software packages operate outside WindowsXP using bootable disks or CDs to start, as the operating system places limits on hard drive access which make cloning drives directly difficult.

Cloning Procedure; Part 1 and Part 2

The first part deals with the necessary procedures that need to be carried out before and after the cloning process, depending on whether you are moving to a new computer or just moving WindowsXP onto a newer drive on the same computer.

Part 2. deals with the specifics of using Norton Ghost, Hdclone and Ranish Partition Manager to do the actual cloning process. During the course of following the instructions in the first part, you will be instructed to see the specific directions for the cloning program you are using, which are in the second part of this section.

It is important to stay awake and alert while you are performing the disk cloning procedures we detail below. Even though modern disk cloning programs are significantly more user friendly than they used

to be, it is still quite possible to accidentally erase your data while attempting to copy a drive.

Generally, this occurs when the user chooses the wrong source and target drives, and accidentally copies an image of the blank, new drive over the old drive containing his or her data. While you still may be able to get your data back in this instance, it's better to avoid mishaps altogether by paying attention throughout the procedure.

Part 1A: Installing a new drive for cloning

Before we begin cloning your operating system hard disk to another disk in the same computer, we'll need install the new hard drive. If you have already done this, you can skip ahead to the next section that covers the different cloning software programs.

To install a new hard drive in your computer, first turn off the power and open up your computer. If you are using an IDE hard drive, we'll be installing the new hard disk as a secondary hard drive in the PC.

Most motherboards will have at least two IDE connectors. Each of these can accept two hard disks or CD drives using a single 80-pin IDE cable with two connectors. Examine your computer's current configuration by taking the side panel off.

Examine the top of your hard-drive. There should be a chart depicting the necessary jumper settings to make the drive a master or slave device. Otherwise, the chart will be somewhere on the body of the drive.

If you are plugging the new hard drive into an IDE cable which has no other drives connected to it, you need set the jumpers to the 'master' setting. If there is already a single CD drive or hard disk connected to the IDE port you wish to use, set the 'slave' jumper setting on your drive. It's also a good idea at this point to look at any devices already connected to the same cable and make sure they are not also set to the same master or slave setting as the new drive.

The jumpers which need to be adjusted are on the back end of the drive as pictured below.

Ensure that they are set correctly to enable the drive as a master or slave drive as necessary. Insert the drive into the drive-tray and screw it in securely on both sides. Attach the power cable to the drive, and then the IDE cable. The IDE cable is keyed to only fit in one way, but to make sure, the red or blue line on the cable should be facing toward the hard drive power cable.

Reboot the computer and press (del) at the POST screen to enter BIOS configuration. Depending on your motherboard, either go to basic CMOS setup or auto-detect IDE devices if this option is available. With either option, your new drive should be visible in the slot you installed it (i.e. Primary master/slave, secondary master/slave) and should show the full available size of the drive.

Newer SATA (Serial ATA) drives will auto configure themselves once installed. If your motherboard can accept these drives, your manual will say so. Once the new hard disk is successfully installed as a slave drive on the primary channel, it's time to run the disk cloning software.

Part 1A: Before and after the Cloning

Depending on the software you choose, follow the instructions below to clone your old drive onto your new one. Be sure you pick the old drive as the source and the new drive as the target! If you are not sure which drive is which, STOP, do not guess. Turn the computer off and unplug the new drive and then when you power up the computer go into the BIOS and make note of the old hard drive's name. Turn the computer off, plug the new drive back in, and power up the machine back into the BIOS. Make note of the new hard drive's name and then continue on.

We're going to jump ahead briefly and talk about what you need to do once the cloning operation is done. These are important steps, and we want to make certain they are not overlooked; we'll get into the cloning process in just a moment.

Once Finished Cloning, Don't Forget To...

Once the cloning operation is complete, power off your system again and replace the old drive with the new one entirely. It's best to physically remove the original OS hard drive so you don't make any mistakes here. Be sure to set the correct jumper setting on the

drive for its new position. This will generally mean you need to set the newly cloned hard drive to the 'master' setting.

Power on the system again, the newly cloned hard drive should be detected automatically during the POST procedure. If it is not, you will need to go into the BIOS to detect it as we've mentioned previously.

Assuming the hard drive is detected, your Windows XP installation should now boot as normal from the newly cloned hard disk. Once you are sure that everything is functioning as it should, you can install your old hard drive as a secondary drive in the system for data storage. Simply follow the steps listed above for installing a second drive.

When you boot into Windows XP your old drive will be present and you can partition and format it as you wish. *I recommend you double check that the cloning operation was fully successful before you go about formatting the old drive however.

Note that it is possible (though unlikely) that Windows XP might require re-activation after this procedure. Don't panic. Simply follow the on-screen steps to contact Microsoft by phone and obtain a reactivation key. This is a fairly painless process.

Part 1B: Cloning for a new computer

Cloning your WindowsXP installation for a new PC is a slightly more complex procedure than simply cloning Windows XP onto a new hard disk on the same computer, since the underlying hardware also changes. This necessitates a 'repair install' of the operating system, in which the essential system files are reinstalled while leaving the registry and all data and programs intact. Once these procedures are complete, you will also need to reactivate your copy of Windows XP and probably install drivers.

Note that depending on the make of the computer system ou have purchased, opening the case and copying over the hard drive may bring warranty issues, so check before you do so. Another issue you might want to be aware of is that installing XP onto another computer, even if you no longer intend to use the first computer, is a violation of the EULA (End User License Agreement) of OEM copies of Windows XP.

This copyright limitation does not apply to retail box versions of Windows XP provided you do not use it on more than one system. This issue becomes more of a technicality if you have purchased a new

copy of XP with your new system and simply wish to move your old WinXP install over for simplicity.

For this procedure first power off both computers and transfer the old drive into the new computer s a secondary hard drive. To do this, remove the old operation system hard disk from your old computer and install it in the new computer.

Once you have the old drive connected to the new computer, perform the disk cloning operation using whichever software cloning program you choose from Part 2. of this guide (the specific instructions on how to do this are listed in Part 2. by the way).

What to do when the cloning to the new PC is complete?

When the cloning operation is complete, remove the old drive and boot up the new computer with the windows XP CD in the CD drive. You will need to ensure that the system is set to boot from the CD drive first. If it is not, this can be easily changed in the BIOS.

Press any key when prompted to boot from the XP CD.

You now need to perform a "Windows XP repair install," which redetects all hardware and reinstalls system files without touching the registry or user data present on the system. This process adapts your Windows XP install to the new hardware it is running on. To do this first choose the "press enter to set up Windows XP now" option when prompted. Then, press F8 to skip through the EULA (though if you haven't read it before, you should now), and when the option presents itself, pres "R" to begin the repair installation.

Be very careful not to in advertently set you computer to simply reinstall the new drive. If you do this, the operating system will start from scratch, wiping out your data in the process. The computer will go through the entire XP install process, but will not attempt to replace any of your existing data. It will simply reinstall the system files and redetect all the hardware.

Once the Window XP repair install has completed, boot the system normally. You will be prompted to activate your copy of Windows XP again. Follow the onscreen procedure to activate XP over the phone. Now that you are back in your familiar WinXP environment, the final steps are to reinstall any drivers that may be missing, and to redo any patches and service packs that you applied previously.

Part 1B: Installing Drivers After Cloning

Windows should prompt you to install drivers for any devices it cannot currently use. If you have the driver disks from the manufacturer, use them now. Otherwise, take note of the devices that need drivers and install them separately.

Note that most hardware devices (like video cards and sound cards) tend to come with their own driver install programs, in which case you should run them separately from the desktop to complete the process.

To verify that you have installed all drivers correctly right click on the **'my computer'** icon and select **'properties'** then the **'hardware'** tab.

Next, choose the **'device manager'**.

On this screen, there should be no devices with yellow exclamation marks attached if you have installed all drivers successfully.

If there are exclamation marks, take note of the device(s) that need drivers and obtain them from the manufacturer of your system (or the maker of the specific device) via the Internet. You will also need to replace the patches and service packs that you applied previously to your Windows installation, as the repair install removes these. To do this, simply run windows update from 'start\all programs' once you have your Internet connection setup

Once you are fully up and running again, you can reinstall your old hard drive onto the new system as a secondary drive if you wish. Simply follow the drive install procedures we've already outlined, then format the drive from Windows to use it for extra storage.

Partitioning unused space on your new hard drive

Both freeware utilities featured in this article share one characteristic. They do not partition or format the extra space made available when you clone your Windows installation to a larger drive. You can't use the extra space until it is partitioned and formatted by WindowsXP, so it's only fair that we tell you how to do that too. :-)

Once you have successfully cloned your drive right click **'My computer'** and select **'manage'** then **'disk management.'**

Your new drive should be 'disk 0' in the bottom window. If you used HDClone or Ranish Partition Manager to clone the drive, you should have an area of **'unallocated'** space to the right of your 'C:' drive area in the lower pane. Right click on this **'unallocated'** space and select **'new partition.'**

This will bring up the partition wizard. Click next a couple of times and you will be prompted for the amount of disk space you wish to allocate to your new partition. Choose all of it (the default)

unless you wish to make several smaller partitions to organize your files. You will be asked for a drive letter to assign the drive, and then given the option to format it (which makes it available to Windows for use). Accept the defaults for both of these options, click 'finish' and wait for your new partition to be formatted.

The whole of your new disk is now available for use. Alternately, you may wish to use a third party utility like Partition Magic to append the extra space onto your 'c:' drive. While the procedure is beyond the scope of this guide, sufficient instructions can be found within the programs themselves.

Using Norton Ghost

Start Norton Ghost and select 'ghost advanced' from the menu on the side.

Choose the 'clone' option and click 'next.'

Select the source you wish to copy from in the left pane. Note that if your old drive contains only a single partition (only the C: drive) it's best to choose that partition only, so highlight the 'c:' partition.

If you have multiple partitions (c:, d:, etc.) then highlight the whole disk (disk1, disk2). Ensure that you have selected the correct disk by examining the disk size and manufacturer information below.

Select the destination you will copy to from the right pane. Whole disks must be copied onto whole disks, and partitions must be copied onto other partitions or unused space. Invalid options are grayed out.

Once you are sure that you have selected the correct options, click 'next' until you arrive at the Norton Ghost task summary window.

Verify your settings again, then click 'run now.' Your system will reboot and load up Ghost's DOS environment and the cloning will be performed. This could take a while. Once the process is complete,

your system will reboot again and load Windows back up.

Verify that the operation was successful by going to 'my computer' and examining the contents of both drives, or by starting the computer management 'my computer' and choose 'manage') and going to 'disk management.'

Using HDClone

After downloading HDclone, extract the 'Hdclone20fe' compressed file to a directory.

To run Hdclone, you need to create either a bootable floppy disk or a bootable CD. A floppy is probably the easiest option, so let's cover that first.

Run the 'install' executable from the directory you just created.

Insert a blank formatted 1.44 floppy disk into your drive and hit the 'start installation' button. This will create a blank floppy with the required files.

To create a bootable CD, use a CD burning program such as Nero. Select 'CD-ROM (boot)' as the type of disk you wish to create (note that this command will differ in other programs like Roxio, but you are looking for the option to make a bootable CD). Use the 'hdclone.img' file from the Hdclone directory to create the CD.

Boot your system from the floppy or CD you have created.

Select the drive you wish to use as the source, then the drive you wish to use as the target.

Please pay attention and make certain you select the right hard drive! If you don't you may erase all of your information. If the target drive has data on it, you will be warned and required to enter a key combination before cloning can start. Begin the process. This will take a considerable amount of time, so find something else to do.

Once the process has completed, exit Hdclone.

Your new drive will now contain an exact copy of your old drive, and a portion of unpartitioned space making up the difference between

the sizes of the two drives. This can be partitioned and formatted using disk manager (right click 'my computer' and choose 'manage' then 'disk management') or appended to the rest of the drive using a program like Partition Magic.

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