



## Create a Reliable Backup System

by  
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If you have never had a hard disk drive crash or tried to move your software from one machine to another you may not be aware of the difficulties that this entails. Let me start by dispelling some common misconceptions. Even if you are an absolute fanatic about backing up your computer you still may not be able to recover or migrate all of your software. Why is this so? There are several different types of backups and they each have different challenges.

### Data Backups

All the information you enter into your word processor, spreadsheets, databases, etc. is a part of your data. These files are files you create and they won't be backed up unless you do it. Software that has been created to facilitate data backups does not necessarily backup your application programs. Unless you have gotten heavily into digital photography, recording videos, or have a massive music collection your data is probably only a small portion of what is on your hard drive. Thus you won't have to back up that many files and it is only necessary to backup files that have changed. While compression is possible I prefer the type of data backup that copies the files in their normal format and organizes them the same way that they appear on my hard drive. With this sort of backup it is easy to access the backup copy of any data file at any time without running any special software to do so. All you have to do is supply the address of the backup copy instead of the address of the original.

The program I use to perform data backups allows the user to choose whether or not he/she wants it to remove from the backup any files that have been deleted since the last backup. The only precaution you must take when using this type of data backup is that any and all changes you make to your files must be made to the original copy. It is possible to maintain duplicate sets of files in absolute synchronization based on the date and time the file was created. I can tell you from my own experience that this gets very confusing if you sometimes update one copy and other times update the second copy.

### Image Backups

There are a number of backup programs that attempt to create a complete image of everything that is installed on your computer, including both software and data. The challenge for these programs is that it is nearly impossible to create a backup copy of a program that is currently running on your computer. Even with image backup programs you need to have a copy of the operating system written to a new, replacement disk drive before you can restore your applications and data to it. This copy of the operating system can be made from either the original installation disks or from a special disk created by the backup program.

Image backup programs will report an error if the content of any file changes between the time it copies it and it attempts to reread the file for verification. Unfortunately there seem to be quite a few files of this type. If you exclude them from the backup then your backup is incomplete. If you include them you probably won't be able to verify the accuracy of your backup image.

There are several disadvantages to using image backups. First, most are written to compress a large number of files into a single large file. In this case only the software that wrote the backup file can read it. Additionally, most image backup programs will not allow you to restore files onto a new system or drive that differs significantly from the original one. Usually you can get by with a larger hard drive but you should not make any other changes to the system. The files can only be restored as an image of the original file structure. I find this acceptable if you are replacing a failed hard disk drive but not when you are moving to a new machine.

### The Safe Way to Do It

You probably aren't going to want to hear this but this is the voice of experience speaking so listen up! **You have some work to do.** You need to gather up every installation disk or file for every software application that you have on your computer and you need to keep them organized and in a safe place. I'm amazed at how many of these seem to become mislaid. Most of the commercial software now comes on CDs and these generally come with a special unlock code that you will need to install them properly. The first thing I do with every installation CD I get is copy that code onto the label side of the CD using an ultra fine point Sharpie permanent marker. Then I have only one thing I mustn't lose.

Because a large number of CDs in their original packaging take up a lot of space I keep all of my CDs in special

file boxes that hold 80 disks each. Obviously I have several generations of these at this point. Ideally you should be able to go right to the container, pull out the correct disk, write down the number for when it asks you for it, and then proceed to install it. This isn't the only way you can move SOME software (see note below) but it is the only way you can move ALL OF IT.

What about the files that you have downloaded and installed? I keep a directory on my hard disk drive that is named Installed. I include this directory in my data backup to assure that all of the freeware and shareware installation files are backed up with my data. While I can say that the backup of the Install directory contains the installation files for all of the shareware and freeware installed on my machine, I'll have to admit that there is a lot of stuff in there that doesn't belong there any more. Cleaning this up will be a good project for some miserable winter day. I have placed all of the original downloaded files into labeled subdirectories of the Installed directory because you can't always tell what they are from the file names the author used. I have created a special subdirectory that contains the unlock codes for all of the shareware programs that require one. I also have a special subdirectory of my email client that contains the unlock codes that I received as an email. I make sure that this directory is also backed up with my data. The point is, just like the software CDs, these files may be worthless for reinstallation if you have lose the code that unlocks the installation routine.

I'll note here that I have found that many of the shareware authors from whom I have purchased/licensed a copy will send a copy of a lost unlock code for the programs you have registered with them. I've even been told that I did not have to purchase a shareware program because I had registered a much earlier copy which had a different name. The author simply sent me the unlock code for the latest version.

Whether you need help doing the installations or not, whoever does the installation will need access to the installation routines and their unlock codes. Programs that were installed using a disk borrowed from a friend or neighbor are going to be hard to replace if you returned the original without making a copy.

### **Software Tools**

Thanks to Mary O'Neill who proofreads these articles preparatory to putting them up on the website I am adding this note to include mention of software tools like Belarc's Advisor. As a part of the analysis Belarc Advisor prepares when you run it on your system there is a list of software programs and their version numbers that are installed on your computer. Even more helpful is the list of Software Licenses. On my system the latter included the license keys for ACDSee32, Adobe Photoshop Elements (both 3.0 and 5.0), Several discrete programs that are a part of the Nero CD/DVD burning software, Belarc Advisor, Macromedia's HomeSite, and six Microsoft programs including IE, Office, Photo Story 3, Web Folders XP, Defender, and XP Media Center Edition. Please note that last item. Belarc will give you both the number that comes on the Windows installation disk and the Key code to unlock it. I have known people who bought a new copy of Windows because they had lost the key code for the old one.

### **New Developments in Software Packaging**

Recently software developers have begun to create what is termed "portable software" which differs from the other applications in the way in which it is installed. Portable applications are installed into a single directory with all parts of the program located in that directory. Typical Windows applications have files located in the Program Files directory, one or more Windows subdirectories, and in the Windows Registry. These programs are very difficult to move without detailed instructions from their creators. A portable application can be moved to a new hard drive or a new machine by simply copying its directory. This is a movement that really needs to be supported because it can make backups and restoration much easier.

### **Where Do You Put the Backup?**

I have used virtually everything from floppy disks to a dedicated file server as the target location for my backups. Every method I've used has a flaw of some sort. My current method uses a file server which is located in remote area of my house where at least some types of natural disaster may not hit it as well as my other machines. But a remote site outside of your home would be better. My server backs up five computers which is the main reason that I am using it. One copy of the software runs on the server and copies files over a wired network to the server. The program I am using is called [2nd Copy](#).

I look at it this way, if the backup process gets too cumbersome I won't use it as religiously as I need to. I need a system that can be easily automated. I have set up the software to perform the backup of my data files and the special directories I have mentioned between the hours of 4:00 - 6:00AM on three nights of the week. All the files easily fit on about half of a 320GB hard drive. The hard drive is installed in a plug in shell that can be

removed from the computer by simply pulling it out by its handle.

Using the same hard drive that contains the original copies of your files is of limited value. A hard drive crash will destroy both copies. The benefits of an external copy can be obtained by burning the backup to a CD or DVD or by using a thumb drive. Adding a second hard drive will provide even more space but having it external to the machine that contains the original is best.

A backup system for one or two computers can be created by using some form of removable drive that can be plugged in to a USB port. These drives can be removed quickly and easily during severe storms, while you are on trips or can be grabbed and taken with you if you are forced to flee your home. Remember, your collection of installation CDs makes recovery after a hard disk crash easier and cheaper but in the event of a natural disaster these too can be replaced, only your data cannot be replaced.

If you are running a local area network a removable drive on one machine can be set up to back up all the computers in the network automatically.

Other alternatives include on-line Internet services that allow you to store files at remote locations. These are becoming more common and less expensive. I'd investigate carefully before placing copies of my financial data onto such system but I'm confident you can find one with adequate security.

### **In Summary**

The most important thing to remember about back up systems for your software is to use them. While it is possible to concoct a backup system that is absolutely fool proof the chances are it will be so cumbersome that it will never be used. Having your installation disks organized and knowing the codes that unlock them will assure that you can reinstall all of your software applications if you need to do so. A simple and reliable method for backing up your data completes the chore. Fortunately hard drive crashes are not a frequent event. In my case it has been a combination of luck and frequent system purchases that have made me more interested in moving (migrating) my software to a new system than restoring from a dead computer. I have to be honest and admit that the process of setting up a new computer complete with all the software and data from my older computer is not a chore I want to do every day. There may be faster ways to accomplish a migration but I prefer to have a clean start on a new machine instead of simply dumping a copy of all my old software onto a clean new machine.