

# Carl's Computer Column

## Backup Your Data!

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What is generally the most valuable part of any computer system? Is it the monitor? No. Is it the purchased software? No. Is it the computer itself? No. Generally the most valuable part of a computer system is the data that it contains!

Generally the data on a computer is either entirely impossible to reproduce or can only be reproduced with the expenditure of much time and effort. Let us consider a simple home computer that has a minimal amount of data: some photographs that were downloaded from a digital camera and some written text (letters, recipes, and papers for school). Although the owner of these items might not consider the loss of these items to be terrible, he or she might be upset that certain photographs were lost and that the letters, recipes, and papers would need to be retyped.

If that same computer also had simple business data (a list of charges billed and payments made for a home-based business) and that were lost, reproducing the list from a paper trail might take hours or days. Again, not awful, but certainly not a happy state of affairs. Now take that same computer and add the history or financial records of a volunteer organization (like the treasurer's reports of a fire company, or the recording secretary's minutes of a church group) and the data suddenly becomes impossible to reproduce!

The situation becomes even more critical if the computer is used for business: client information may not exist anywhere but on the computer. The list of charges billed and payments made might be hundreds or thousands of entries, stretching back months or years. To reproduce that list might be impossible, and without that list it might be impossible to bill customers for work performed or items sold. A business might not survive the loss of its data!

So what to do? The best and easiest way to defend against the loss of data is to make a secure and safely stored copy of the data. Before we can determine what "secure and safe" means we must first understand the threat to our data. There are several different ways our precious data could be lost: The hard disk on which the data is stored could fail (due to manufacturing defect, age, or electrical surge). The data could be accidentally erased (human failure or software failure). The data could be maliciously erased (computer virus, unhappy employee, outraged spouse, wretched child). The computer could be stolen (maybe the surroundings are pilfered too?). The computer (and its surroundings) could be destroyed by fire or flood or insects (the

computer term "bug" comes from a spider that took up residence in an early multi-million dollar mainframe computer).

So what to do?

Some people simply make a duplicate copy on disk of the perishable data. That is good for losses caused by #2 and maybe #3 above, but would not defend against even a failed hard disk. Some people have two hard disks in their computers, and copy critical data from one disk to the second. This is better since the failure of a single disk cannot cause the loss of the data, except if that failure was the result of an electrical spike that burned out all of the disks in the computer.

Some people back their data up to tape or to another magnetic medium (Zip cartridges, for example), and reuse the media each time they do a backup. This is fine until the computer fails while overwriting the magnetic media (electrical spike again destroys all).

Simply having multiple tapes (or other media such as CDs) that are rotated solves this problem nicely and even gives a buffer in case the data is lost but the loss is not realized until after several of the tapes have been written over a period of days or weeks.

The final chapter in the defense of the loss of our backup media is to physically remove the backup from the vicinity of the computer. The best removal of the backup media is to remove it from the site, that way a fire or flood at one site cannot destroy the backup, and would permit the business to get back on its feet as quickly as possible.

Finally, it must be ensured that the backup media is readily readable. This means that the device that is used to read the media should be readily available (in case the original device is lost or stolen), and that the software used to write the backup is also readily available. And in all cases, the backups should be tested periodically, by actually restoring (a sample of) the data. A friend of mine lost six months work on his Ph.D. thesis because the software that he thought was writing his backups had a bug in it – even though the tape moved in the tape drive, the backup was never actually written!

Naturally, the choice of backup media is a function of cost, capacity, and convenience. Similarly, the choice of backup software must also be based on cost and convenience.

How valuable are backups? Do you buy insurance for your car, your home, your health, your life, and your business assets... but not for your data?

*(Carl Kass has a Master's Degree in Computer Science from Columbia University, School of Engineering and Applied Science. For the past 15 years he has been an independent consultant, satisfying the computing needs of small companies. Carl Kass can be reached at CarlsColumn@AOL.com.)* 🍀

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