

## **Data Backups**

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PCS provides computer and network support for many Central Kentucky businesses. A recurring problem that we find is the lack of an adequate backup system. If your business depends on computers and the data they contain, this article is for you.

### **Why Backup**

When discussing data backups with a client, I usually start with this question: “What is the failure rate of computers?” The answer, of course, is one hundred percent. A computer is a machine and sooner or later it will fail. You don’t expect your automobile or your television to work forever. You shouldn’t expect your computer to last forever, either. While I have seen computers last up to ten years without any problems, I have also seen new computers fail in less than thirty days. There is also a risk of loss due to fire, weather, and theft. Properly backing up your data is the best way to guard against computer failure or damage.

### **What to Backup**

At the very least you should be backing up your critical data. For most small businesses this would be the data associated with bookkeeping software. It may also include other databases, documents, spreadsheets, and photos. By using a large capacity tape drive or external hard drives, you can even do complete backups of an entire system. This is a particularly good idea if you have a lot of different software that stores data in various areas of your computer’s hard drive, or if you’re not sure where on the hard drive the data is stored.

### **How to Backup**

You will need some type of media to hold your data. Choices include optical drives (writeable CDs and DVDs), flash drives, external hard drives, and tape drives. An important characteristic of all good backups is the ability to remove the media from the computer system. Do not depend on a built-in device as a backup system. Another option is to use an on-line backup service. Read more about this subject later in this article.

Some bookkeeping and database programs have built in backup routines that can be used to put a copy of their data onto backup media. In other cases, as with tape drives, special software may be required. Many of the media types mentioned come with software that can be used to backup or copy data. You can also purchase software packages designed specifically to do data backups. At the very least, you can simply copy files from your computer’s hard drive to optical drives, flash drives, or external hard drives.

Regardless which type of backup media you use, remember that all of them suffer from wear and tear. I usually recommend replacing tapes at least once a year. If you use optical

drives, the media can be replaced every few months without breaking the bank, so just do it. It is also a good idea to test your backups occasionally by restoring a couple of files back to your computer. Be careful not to over-write your existing data when you do this. Most tape drives have cleaning cartridges available. Use the cleaner as recommended by the manufacturer.

### **Media Rotation**

Proper media rotation is, in my opinion, the most important and least understood aspect of data backups. Just like computers, all types of backup media will eventually fail. If you rotate through multiple backup media, you are likely to have a good backup even if one or more of them fails. But even if backup media never failed, consider this scenario:

*John owns a small business. He uses bookkeeping software to do payroll and to track his accounts payable and accounts receivable. Every evening, he backs up his computer onto an external hard drive. John is quite frugal, so he only bought one external hard drive and he re-uses that same drive every evening. One day, John discovers that a bookkeeping error had been made two weeks earlier. That error caused all subsequent data entries to be wrong. The best course of action to correct these errors is to restore a backup from two weeks ago and re-enter two weeks worth of transactions. Unfortunately, John's one backup drive gets overwritten every night, so he must now start all over and re-enter an entire year's worth of transactions.*

Our friend John has just learned the definition of the term "data retention period." In his case, the data retention period is only one day. Also, this backup method does not allow for offsite storage. Why is offsite storage so important? Well, consider what you would do if your computer system were damaged by fire and all of your backups were in a cabinet next to the computer. Sometimes when I ask a client this question, they laugh at me, point to their fire-proof safe, and say "You silly computer geek, we have a fire-proof safe." Then I ask if the fire-proof safe is also heat-proof. Those tapes and flash drives might not burn, but they sure will melt. This illustration points out two important facts: For data security, your sock drawer at home is better than a fire-proof safe at the office; And you shouldn't make fun of your computer support guy.

The following paragraphs describe three basic media rotation schemes, offering varying levels of safety and data retention. One of them should work for your business.

#### Simple Rotation

This method involves using multiple drives (or disks, or tapes), rotating through all of them and then repeating the process. This method is a bit more secure than using only one drive because it provides a longer retention period and it allows for offsite storage. An example of this method would be using five drives labeled Monday, Tuesday, Wednesday, Thursday, and Friday. Each business day backup your data onto the

appropriate drive and then reuse the same drives the following week. Every day, take the backup drive offsite and the next day return the drive that was already offsite. In this example, there is a one week data retention period. The more drives you put into the rotation, the longer the retention period.

### Better Rotation

The best way to describe this scheme is by example: Use six drives (or tapes) labeled Monday, Tuesday, Wednesday, Thursday, Friday-1, and Friday-2. On Monday through Thursday, use the drive designated for that day. On Fridays, alternate between the drives labeled Friday-1 and Friday-2. Every day, take the backup drive offsite and the next day return the drive that was already offsite. This rotation scheme provides a data retention time of two weeks. Of course, you can increase retention time even more by using more Friday drives. My advice is to use as many Friday drives as your budget will allow.

### Best Rotation

This method requires 13 drives labeled as follows:

Monday-1	Monday-2	EOM-1
Tuesday-1	Tuesday-2	EOM-2
Wednesday-1	Wednesday-2	EOY
Thursday-1	Thursday-2	
Friday-1	Friday-2	

As you might guess the Monday through Friday drives are used to cover a two week period and are reused every two weeks. But on the last business day of a month, the daily drive is skipped and one of the end-of-month drives is used instead. At the next month-end, the other EOM drive is used. The two monthly drives are rotated in this manner until the end of the year. On the last business day of the year, the end-of-year drive is used instead of a monthly drive. This method provides a total data retention period of up to one year, plus access to more recent data backups from the daily and monthly drives. Every day take the backup drive offsite and the next day return the drive that was already offsite. All monthly and yearly drives can be kept offsite when not in use. You may even want to consider using a new drive each year-end so that you have a permanent copy of your year-end data.

### **On-Line Backups**

There are several on-line services that allow you to backup your data through the internet. Using internet-based backup removes all concerns about media wear and tear and off-site storage. Your backups are stored on someone else's hardware at some distant location. Depending on the abilities of the backup service, data retention may still be an issue. It is important to know whether your existing backups are being overwritten each time a new backup is done, or are your existing backups being preserved for a while. If you choose to

use an on-line backup service, be sure to understand how the service works with regard to data retention.

### **Mixing It Up**

You can, of course, use more than one form of backup. If your computer has a tape drive that makes a backup of the entire system every night, you can still copy your bookkeeping database onto a flash drive. Likewise, you can use a set of external hard drives and also subscribe to an on-line backup service. You may also want modify one of my rotation schemes or use an entirely different one.

### **Conclusion**

The question is not whether your computer will fail, but when. If there is important data stored on your computer you need to do backups. The three important characteristics of a good backup system are:

Removability: After a backup is made, the backup media should be physically separated from the source computer, preferably by a few miles.

Rotation: Use multiple tapes, drives, or disks to increase the data retention period and to guard against failure of backup media.

Consistency: Backup often and regularly.

**Contact PCS if you questions about backing up your important data.**