

Data backup – to avoid a data loss disaster

For anyone who uses a computer on a regular basis, data backup is very important. Data backups are critical for cities and rural water districts because of the volume and value of information stored on most computer systems. When performing data backup, files are being stored on a disk or drive separated from the primary computer. Remember, it's not a matter of **if** a computer will fail; it's a matter of **when!**

Think of a computer's usable life as if it were a light bulb. When reading the package, you find that light bulbs have a life expectancy of 1000 or more hours. That doesn't mean that is exactly what will happen – but 1000 hours is the **normal** life cycle. A normal bulb may work lots longer or much less.



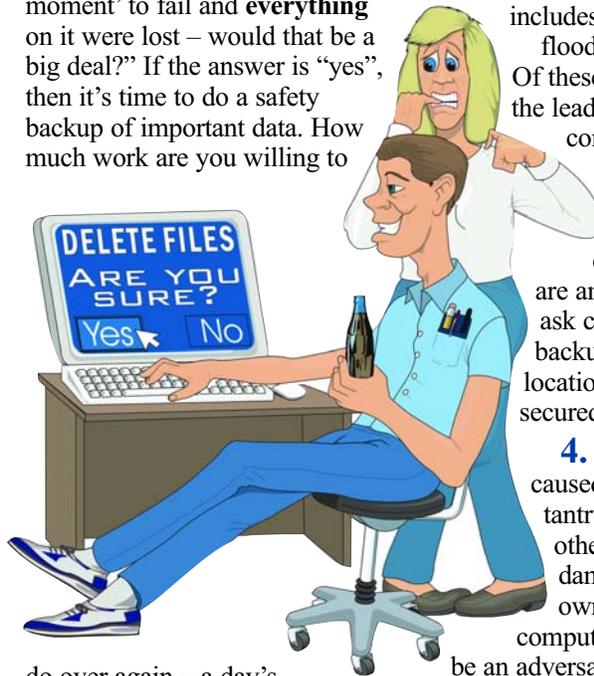
Merle Windler
Thoroughbred Systems, Inc.

Most computers have hard drives with a life expectancy of five to seven years. The hard drive stores 'critical' data. The hard drive in any machine may not last five to seven years. A number of factors affect a computer's life

expectancy. These work environment factors include: dust, room temperature, a chain-smoking operator in a room with poor air circulation, shock or vibration exposure, and electrical voltage fluctuation or spikes.

If data stored on the computer is valued, then my advice is simple: **backup, backup and more backup!** This question literally should be asked each time one

begins to use the computer: "If the computer were to choose 'this moment' to fail and **everything** on it were lost – would that be a big deal?" If the answer is "yes", then it's time to do a safety backup of important data. How much work are you willing to



do over again – a day's, week's, or month's worth? Or, are you willing to just throw away the information completely?

Top 5 Countdown of Data Loss

5. Natural catastrophe which includes: lightning strike, fire, flood, hurricane or tornado. Of these events, lightning is the leading natural cause of computer damage here in Kansas. The catastrophe may or may not include data loss. These events are among the reasons we ask customers to keep backup data at another location or on-site in a truly secured vault.

4. Physical conditions, caused by: burglary, temper tantrum, clumsiness or other inadvertent physical damage. Even if the owner truly loves that computer, at times it seems to be an adversary. Everyone can relate to the old cartoon of the hammer wielding computer user leaning over his keyboard with the

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When people are asked why they think backups are important, the answer is almost always, "In case the computer crashes." The following are my top five reasons for doing backups, in order of least common to most common occurrence. This list is compiled from more than 20 years of field experience helping cities and RWDs troubleshoot computer systems.

caption, "Hit any key to continue." Considering the sizeable investment wrapped up in this pile of metal and plastic, most physical damage is more often caused by accident, except where criminals are the human element. The most common loss of data in this category is caused by theft. Even botched burglaries often leave a trail of destruction and data loss. One of our customers found the discarded

computer's remains at the edge of a river, stuck in the mud.

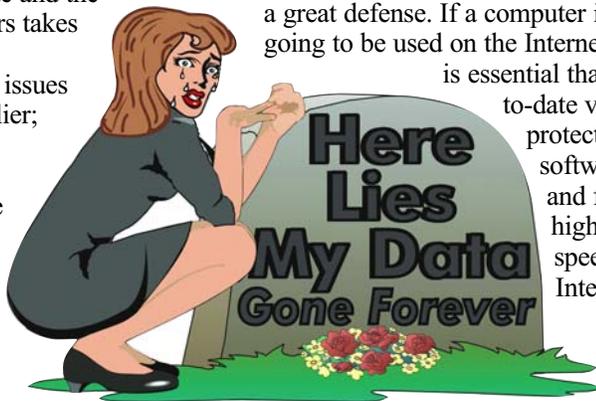
3. Computer hardware failure, sometimes referred to as "computer crash." Actual mechanical or electrical failures are a more common reason for failure and data loss than the ones listed above.

Like most things, time is not on the computer's side and the passing of years takes its toll. Also, environmental issues mentioned earlier; heat, dust, and smoke could shorten the life span of computer components such as the hard drive, where the data is stored. Here's a

good example. An office visit by one of our customers who experienced persistent hard drive problems, revealed that hardwood office flooring had enough give that when office workers crossed the room the floor quaked. This shows that computer death is often precipitated, as in humans, by a life of abuse. This abuse can also include: children at play bumping the desk, smoking, kicking the computer desk, running the computer in a hot or damp office. All of this computer abuse may contribute to failure.

2. Virus attack or other malicious virtual attack. Computer

repair people spend the majority of work time addressing this type of virtual vandalism. Problems from virus attacks are compounded when owners don't have current backup and ask the technician to retrieve data. With this request, the bill skyrockets even though efforts to rescue data may or may not have been successful. The best offense is a great defense. If a computer is going to be used on the Internet, it



is essential that up-to-date virus protection software, and for high speed Internet, firewalls, be in place. It is always imperative that regular backups be accomplished.

1. Computer operator error. The most common causes of data loss comes from users or other non-malicious often well-intentioned friends, relatives, coworkers or, the most dangerous of all, self-proclaimed 'computer experts'. Think twice before letting a daughter's new boyfriend, the 'computer wiz,' near your machine. No matter who is working on the computer, a recent backup is mandatory and the only way to ensure this is to do regular backups.

New technologies bring fast and less expensive backups

In the last couple years, the gap between the ever-larger hard-disk drives and affordable methods to backup gigabytes of data has virtually disappeared. Now, low cost internal and external hard drives, rack hard drive backup systems, USB (Universal Serial Bus) drives and dual layer DVD/CD burners have all dramatically dropped in price. These new technologies are more dependable than the slow and cumbersome diskette, zip, jazz, superdisk, and tape options of years gone by.

There is no longer a good excuse for not doing regular backups to protect data. If the municipality or utility's budget can't accommodate new reasonably priced backup options available today, it's a good idea to start talking about a rate analysis to make money available for equipment and support essential for sound business operations.

Modern backup options

USB thumb drives are one of the greatest things since 'running water'. You've all seen them - 'cute' little memory sticks about the size of a package of gum. All Microsoft Windows versions since the ME (Millennium Edition) - including all new computers with Windows XP, recognize them when they are plugged into a USB computer port. Windows 98 will work with them, as with many

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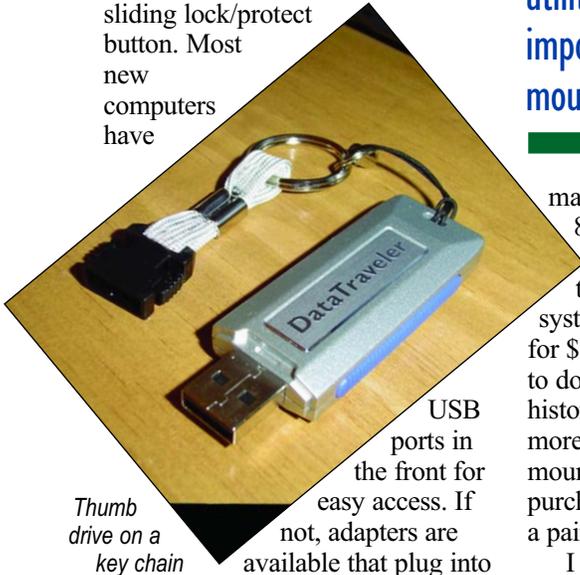
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other new devices, but **only** after downloading a software driver from the manufacturer's Web site. Most new computers sold in the last four years have many standard USB ports. USB thumb drives come in a variety of capacity sizes and colors, many with a neck strap or key chain. They password lock or physically protect data by locking the unit with a tiny sliding lock/protect button. Most new computers have



Thumb drive on a key chain

USB ports in the front for easy access. If not, adapters are available that plug into

the computer's back to provide a handier front connection.

Rack hard drives and USB external hard drives are the

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I often install a "Merle's Magic Button" using 'batch files' to make backing up automatic for my customers, with just two clicks of the mouse on an icon. Backup software utilities can also be used to 'magically' backup just the important critical data to the safety of the rack mounted backup drive in a matter of seconds.

mainstream backup of choice. An 80-gigabyte hard drive, which is incredibly large for the typical small city or water system office, can be purchased for \$50 or less. Double that amount to double the capacity. More historical archives now become more affordable to store. Two rack mounted hard drives can now be purchased for less than the price of a pair of antiquated tape cartridges.

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to 'magically' backup just the important critical data to the safety of the rack mounted backup drive in a matter of seconds. Or, once set up, an exact copy of the entire C-drive can be sent to the backup rack drive by simply selecting a desktop icon. USB external drives, while usually not as fast, have the added advantage of portability to virtually **any** computer with a USB port, allowing for easy movement of data from one computer to another.

SATA hard drive technology is a new technology that has become mainstream in just the last few months. SATA drives are slightly faster than traditional IDE drives. They are even more dependable and when mounted in racks, are 'hot swappable'. Meaning, you don't have to shut down your computer to change, which drive allows the SATA rack to have backup data copied to it. SATA are fast becoming the new industry standard as prices continue to fall.

Tape drives and the software to run them are usually more expensive, and since tape data is accessed by spooling the tape from start to finish, they are slower and more cumbersome to use. A single tape that holds as much information as the mega-gigabyte hard drives of today quite often cost as much as a hard drive.

Both CD and DVD burners are reliable and cost-effective choices

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for backup. A CD burner can write about 700 megabytes to a single disc. In other terms, a CD disk holds about 700 million bites or approximately 500, 3.5-inch high-density floppy diskettes. DVD

What should I backup?

The specifications of the computer you are using may make this choice for you as limitations may exist depending on the age and features of the machine.

If an operator will be using one of the great new USB thumb drives, or a CD burner; he or she will need to pick and choose what records are important, because the thumb drive's data storage capacity is **not** enough to backup an entire computer.

Typically, backup only important utility billing, accounting and other critical data. Cities for example, would back up court information, pet licensing, and cemetery information along with ordinances, and policies. Should a

catastrophic error occur, Microsoft Windows and other software programs would have to be reinstalled from original disks after the computer is repaired or replaced. Then, critical data is easily copied back onto the system from the USB thumb drive or CD.

The best way to duplicate an entire computer's data is to use batch files or backup software. These allow the entire computer, including special Windows System files as well as other special files to be copied. This can't be accomplished with a normal copy and paste backup. These backup programs usually handle every kind of file and store additional information about the state of those files at the moment of backup. This process is best setup by a qualified computer technician.

Another option for a total backup is to install a 'mirror' hard drive that contains an automatic duplicate copy of everything on the computer's main hard drive. The one problem with this approach is that the backup will include operator errors, viruses or other unwanted information. As fast as a



This rack hard drive has key security and is easily disengaged to be carried off-site in a briefcase.

burners can place 4.7 gigabytes (4.7 billion bytes) on one disk. The new dual-layer recorders can write up to 8.5 gigs on a single DVD+R DL.

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computer user can make a dumb mistake, the program will write over good backup data and make a perfect copy of the ‘boo boo’. If used, the mirror method must also have alternative backups that can be

CD-r or DVD+r of critical data at least once or twice a month. It is then stored in a fire proof safe and/or off the premises. Many also, in the interim, do weekly or even daily backups of critical data on a



This USB external hard drive has a 120 gigabyte capacity and can easily be carried to different off-site locations.

called upon in case of a ‘moment of madness’.

Most of our city and RWD customers have a mirror hard drive or do a total backup of their computer systems at least monthly on a USB external or rack mount hard drive system, as well as burn a

rewritable CW-RW or one of the new USB thumb drives.

Another method of data backup that is not at this time universally used or accepted is Internet based backups.

Although these may gain popularity as the Internet and access continue to expand, I do not recommend them. I have a problem with

letting control over sensitive internal personnel and customer data, and it's physical security out of the hands of the local entity.

These remote backup services are available and utilize an Internet based offsite data backup service. And, there's nothing wrong with

doing a backup even more often. I've never had a problem of a customer having too many backups.

Remember, it's the **data** that is important. Insurance may replace a computer but the only insurance to replace data are regular backups.

If not yet convinced, let me close with a horror story. It's a good example of the benefits of having current backups at Douglas RWD 1 in Lawrence, Kan., Office manager Nancy Kuehler was preparing to leave on vacation, was cramped for time, and did not do her usual CD backup. She was, however, a devoted user of the ‘Merle's Magic Button’ icon, installed on the computer. It duplicates data onto a second hard drive in a removable rack with the click of the mouse. Since this was so quick and easy, she always did her rack hard drive backups religiously.

Nancy, relaxed, refreshed, but tired from her trip, returned on Monday morning and watched her computer go ‘belly up’. She knew the machine was no spring chicken and was probably about time for upgrading anyway, but – she just hadn't planned to do it under such dire circumstances! She was already two weeks behind because of her vacation, but fortunately, her rack backup, restored ‘critical data’ from the HD rack backup. It was a snap!

Remember: backup!

I'm glad many people have heeded my advice and years of preaching “backup, backup, backup”. It's not a matter of **will** it happen – it's a matter of **when**!

In Nancy's case, that ‘magic’ one button backup and the few moments it took to use, saved critical data and untold hours of work. Other cases I could mention, involving no backup, caused hours, even days of retyping data by operators to get caught back up.

Please heed the warnings – and safe computing to you.

Employment Opportunity

The city of De Soto, Kansas is currently recruiting for the position of Wastewater Operator. Under the direction of the Wastewater Superintendent, this position is responsible for the operation, repair and maintenance of the wastewater treatment plant and collection system. The incumbent will perform laboratory tests, monitor and maintain flow monitoring equipment, and repair and service grinders, pumps and lift stations.

Requirements: Candidates must have a high school diploma or GED, a KDHE Class I Wastewater License and a Kansas CDL with air brakes endorsements. Candidates eligible to obtain wastewater license and/or CDL within six months of hire will be considered.

Compensation: The starting pay range is \$15.60 to \$17.33 per hour, DOQ. The city provides an excellent benefits package including medical, dental, life, ADD and KPERs retirement.

Deadline to apply: Open until filled. To apply for this position, go to www.desotoks.us/pages/listings.htm and select job application form or send cover letter and resume to the City Administrator (cityadmin@desotoks.us), City of De Soto, P.O. Box C, De Soto, KS 66018. [b]FAX: 913.583.3123