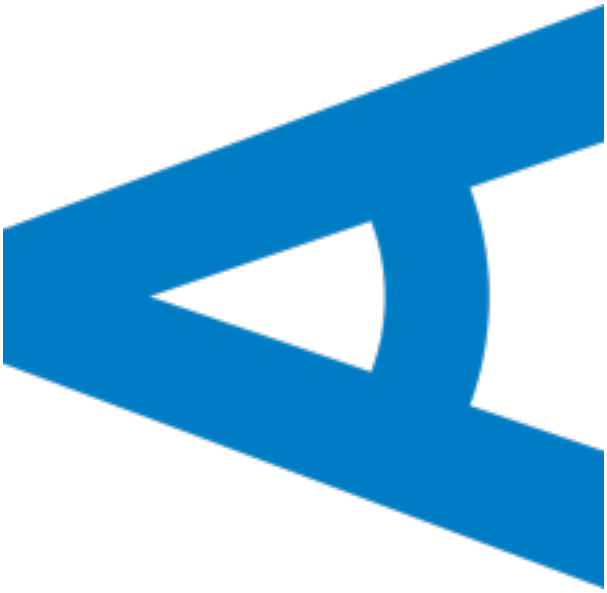

Archiving and Backup whitepaper

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Archiving and Backup

Objective:
1. To provide a secure backup of your computer so that if your HD fails, you can be up and running as soon as possible.
2. To provide a system for your work to flow through an archive stage that is backed up and catalogued.

Tools needed:
1. A raw HD to match the main HD of your computer (in physical size, connection type and a data capacity no less than).
2. External working hard drive or RAID array or NAS
3. A raw hard drive to precisely match the working external drive in data capacity
4. A hard drive dock capable of holding the raw drives (AtkinsTechnicolour are stocking the Vantec dock)
5. A case that is static-proof to store each raw drive (AtkinsTechnicolour will also stock suitable cases)
6. Storage both on and off site for your backup hard drives that is free from static electricity, has low humidity and a stable temperature of around 24 degrees celcius.
7. Cloning software (xxClone for windows, Superduper for Mac)
8. Cataloging software (CDWinder for windows, CDFinder for Mac)

Computer hard drive backup

Reasoning
The problem with most "backup" software is that it creates a back up "archive" or "image" that needs to be restored to recover. The restoration process can take many hours if your hard drive contains a lot of data. This will leave you waiting while your machine rebuilds.

I propose that you create a clone of your computer's hard drive that is synchronised daily to ensure both are identical. If your backup drive is identical to your internal hard drive in both connection type (IDE or SATA) and size (2.5inch or 3.5inch) drive, then a computer drive failure is fixed by a simple swap with the backup. This will ensure you will be up and running in minutes. The only data that can be lost are those which were changed since the previous backup (one day).

A synchronized backup is also called a differential back up. A 'differential backup' takes very little time to perform as the software only needs to change those items on the back up drive that are different to those on the computer's hard drive. The first time a backup is performed it will take a considerable amount of time to 'clone' or 'mirror' one drive to another. After this initial backup, only changes need to be backed up. The only downside to this is that a mistakenly deleted file will also be deleted off the backup when the next backup is performed.

How to
1. Identify your computer's internal hard drive type. In some computers you can open up the case to find out, or you can look it up on the internet, or ask a technician. Typically it will be either a 2.5inch SATA drive (laptops) or a 3.5inch SATA drive (less portable computers). IDE connections were used in older computers. SATA and IDE make up 96% of internal hard drive connections today. If your computer has several internal hard drives you need to establish how they are being used and consult an expert for advice in dealing with these.
2. Identify your computer's internal hard drive capacity.
3. Purchase a "raw" hard drive of the same type as in Step 1, and a capacity of the same or greater than your current computer's hard drive as in Step 2.
4. Purchase a hard drive dock (AtkinsTechnicolour are stocking the Vantec Dock) that will enable you to plug in the new back up hard drive and access it with your computer.
5. Connect up the hard drive and dock to your computer.
6. Format your hard drive to match the formatting of your computer's hard drive. WIndows computer should use NTFS formatting, the Mac will require a single partition with a GUID partition table. Name the back up drives in a sensible way: e.g. "Backup of C".
7. Install cloning software (xxClone for windows, Superduper for Mac)
8. With the understanding that the first backup or clone will take a long time, set the computer to back up your computer's hard drive to your back up drive.
9. Once the first back up is made, set up a schedule within the software to perform a differential/smart/synchronised backup on a daily basis at a time that suits you. A good idea is to pick a time when your computer will be on and connected up but you may be taking a break - perhaps at lunch time.
10. If you wish to be extra secure, you can have two backup drives and rotate them offsite, running a cloning operation each day with alternate drives. Each drive will be two days behind, but you will be very secure from theft or destruction.

Workflow for archiving your images

Reasoning
You should have a flow of your work from “in” to “work in progress” to “archive” where your file can retire safely and still be found. A good workflow will ensure you are most productive when working. It will also ensure your digital jobs are always close at hand.

I propose that you keep your “in” and “work in progress” on your computer’s hard drive if you work primarily on a laptop, but if you work on a desktop computer, it is ideal if you have a working second hard drive to hold these files. This working hard drive can be an external or internal RAID1 mirrored pair of drives such as a MyBook or Drobo. These systems provide an added level of security as the data is stored identically on an array of drives that backs itself up. However, if you live off a laptop, the last thing you want to do is drag around an external HD just to hold your working files. For the security of data, laptop users need to rely on their daily hard drive clone as backup.

Your archive drive needs to be a separate drive system to your working hard drive(s). The archive is where your files go when you have finished working with them. In previous years, photographers used CDs or DVDs as their archive. What is being proposed here is a pair of matched raw hard drives: one is the primary copy of files, the second is a daily clone of the first. The second should be rotated off site with a third to provide the ultimate security.

You move files to this external raw drive that resides in a hard drive dock. Daily, that drive is cloned and catalogued. When the drive is full, the drive is numbered sequentially. Then one copy is moved off site, and the first copy is stored in a case on a shelf for easy access. Both copies are kept identical by your being disciplined in not altering the data on these archive drives. If a file needs changing, it is copied off and re-entered to the archive at the later date of modification. This preserves the original information.

When the archive needs to be searched, the catalogue program is launched and searched. The drive the job resides on is identified, that drive is plugged into the dock, and the files then copied off.

How to
1. Set up a dual hard drive dock with 2 identically sized hard drives
2. Format all drives in the same way
3. Name one drive a number that is sequential in your existing archive process (if this is your first archive disk, call it “1”). This should also be written on the hard drive with a permanent marker.
4. The other disk should be named “Clone of 1”. This too should also be written on the hard drive with a permanent marker.
5. Launch your cloning software and set up a routine that daily clones using a smart/differential backup of drive “1” to “Clone of 1”. The first clone will be instant as disk “1” will be empty.
6. Drive “1” will permanently live in your hard drive dock until it is full, but you will take home “Clone of 1” to be your offsite backup
7. As a job moves from your “work in progress” to your “archive” you simply copy it to archive drive “1”
8. Those files are automatically cloned during the daily clone routine. if you add those files to the drive after the daily clone has happened, you may want to manually run the cloning software before you leave for home to ensure you have two copies.
9. Leaving work means taking “Clone of 1” with you.
10. When “1” is full “Clone of 1” will also be full.
11. When “1” is full run your catalogue software and catalogue the content of drive “1”
12. Remove “1” and put in a case in your office (in appropriate storage conditions-see “Tools eeded”)
13. Remove “Clone of 1” and store it off site (in appropriate storage conditions -see “Tools needed”)
14. Repeat steps with a brand new pair of drives
15. Always remember: when you retrieve files from your archive drive for further work, DO NOT work off the archive drive. Copy these files to your current working drive and and move them through the archive process a second time. This will then always preserve your original work.

The Future
Any archiving and backup system has to survive changes in technology, hard drives are very fast so moving over to newer storage systems will be easy, the ideas put forth here will be suitable for many years to come. The next big change will be the availability of cheap solid state hard drives (SSDs) replacing spinning hard drives.