This is the tenth in a series of short articles reviewing the theory and practice of making backups.

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Workstations

Individual workstations pose special challenges for backup. Although software and backup media are readily available for all operating systems, the human factor interferes with reliable backup. Users are typically not focused on their computing infrastructure; taking care of backups is not a high priority for busy professionals. Even technically-trained users who ought to know better sometimes skip their daily backups; many novice or technically-unskilled workers do not even understand the concept of backups.

If the workstations are connected to a network, there are automated centralized backup software utilities that can protect all the users’ files; however, with user disk drives in the many GB of storage (at the time of writing, new PCs were being sold with 30 GB of disk as an unremarkable capacity) and the popularity of large files such as pictures and videos, storing the new data (let alone the full system) for hundreds of workstations can consume TB of backup media and saturate limited bandwidths (it takes a minimum of 291 hours to transfer 1 TB over a communications channel running at 1 MB/sec). There are also privacy issues in such centralized backup if users fail to encrypt their hard disks.

Portable Computers

Portable or laptop computers are sometimes the only computer a user owns or is assigned; in other cases, the portable computer is an adjunct to a desktop computer. Laptop computers that are the primary system must be treated like workstations. Portables that are used as adjuncts – for example, when traveling – can be backed up separately or they can be synchronized with the corresponding desktop system.

Synchronization software (e.g., the well-known LapLink product) offers a number of options to meet user needs; e.g.,

* A variety of hardwired connection methods, including cables between serial ports, parallel ports, SCSI ports and USB ports.

* Remote access protocols allowing users to reach their computer workstations via modem or through TCP/IP connections via the Internet to ensure synchronization or file access.

* Cloning, which duplicates the selected file structure of a source computer onto the target computer; cloning deletes files from the target which are not found on the source.
* Filtering, which prevents specific files or types of files from being transferred between computers;

* Synchronization, in which all changes on the source computer(s) are replicated onto the target computer(s). One-way synchronization updates the target only; two-way synchronization makes changes to both the target and the source computers.

* Compression and decompression routines to increase throughput during transfers and synchronizations.

* Data comparison functions to update only those portions of files which are different on source and target; for large files, this feature raises effective throughput by orders of magnitude.

* Security provisions to prevent unauthorized remote access to user computers.

* Log files to record events during file transfers and synchronization.

In addition to making it easier to leave the office with all the right files on one’s hard disk, synchronization of portable computers has the additional benefit of creating a backup of the source computer’s files. My practice, for example, is to make a daily backup of my desktop system onto two separate disks (a ZIP 100 MB and a JAZ 2 GB) and synchronize my portable computer every morning before I head off to the University. Then in the evening I synchronize my main computer to keep everything in synch (no, not the rock band).

**Handheld Computers**

Another area that is often overlooked is handheld computers (Palm, Psion, Handspring Visor, RIM Blackberry, daVinci, Helio, HP200LX, Newton/eMate, Rex, Zaurus, Smart Phones, Smart Pagers, PocketMail). These PDAs often contain critically important information for their users, yet not everyone realizes the value of making regular backups. Luckily, synchronizing a PDA with a workstation also makes a backup on the workstation’s disk. Security managers would do well to circulate an occasional reminder to users to synchronize or backup their PDAs to prevent data loss should they lose, step on, sit on, or soak their accessory brain. Some PDA docking cradles have a prominent button which allows instant activation of synchronization, which takes only a minute or two.

In the next article, we'll look at backup retention and rotation policies.

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