

# Backing Up Data

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## Mayfield's 3<sup>rd</sup> Law

- If that file is important, back it up!
- If it's really important, make two backups!
- If it's really, really important, store the two backups in different physical locations (say, one copy at home and the other in a safe deposit box).

## Types of backups

- Full backup – Back up an entire drive or the whole system.
- Differential backup – Save only the differences since the last full backup.
- Incremental backup – Back up files as they change. (Technically, this is saving the changes that have taken place since the last incremental backup.)

## What should be backed up?

- The entire system:
  - Takes more time and space on backup media.
  - If your entire system gets corrupted, restoration is faster.
  - Depending on the backup technique used, this can be used to transfer your system to a new drive.
- User files
  - Less time and space required.
  - If the entire system gets corrupted, you must reinstall the operating system and applications before proceeding.
  - Also can be used to transfer your system to a new drive.

## **Choosing a local backup solution**

- Capacity:
  - CDR – Up to about 700MB; rewritable media available.
  - DVDR – Up to about 4.5GB (about 4,500MB); rewritable media available.
  - BDR (Blue-Ray) – 25GB or 50GB.
  - Flash drive – 4GB to 256GB.
  - External hard drive – up to 4TB (about 4,000GB).
  
- Cost:
  - CDR/DVDR/BDR – \$0.25 per disc in volume.
  - Flash drive – \$5 to \$150.
  - External hard drive – \$50 to \$300.
  
- Speed (maximums):
  - CDR – 3MB/second (rewritable is slower).
  - DVDR – 20MB/second (rewritable is slower).
  - BDR – 50MB/second.
  - USB 1.0 – 1.5MB/second.
  - USB 2.0 – 60MB/second.
  - USB 3.0 – 625MB/second.
  - FireWire 400 – 50MB/second.
  - FireWire 800 – 100MB/second
  - eSata – 750MB/second

## **Local backup software**

- Drag-n-drop of folders or drives onto media.
- Backup and restore (Windows 7 and earlier).
- Windows 7 file recovery (Windows 8).
- File history (Windows 8) – Scans the file system periodically (default is once per hour) looking for changes, and backs up changed files to another location. This is more like the cloud-based solutions. It only works with files that are in one's libraries, contacts, favorites, and on the desktop.

- Third-party backup software:
  - Open source example: Areca Backup (<http://areca-backup.org>).
  - Commercial example: Acronis True Image (<http://acronis.com>).

### **Choosing a cloud backup solution**

- Cloud services generally back up your system (or a user-specified part of your system) to a data server located on the Internet.
- Some things to consider before choosing cloud backup:
  - One has to be connected to the Internet via high-speed connection to back up or access the backed-up data.
  - One must trust a third party to protect your data from unauthorized access.
  - What happens to one's data if/when the service storing the data goes out of business?
  - If one's ISP (Internet Service Provider) has a per month data cap, the initial backup of your system could exceed that cap.
- Costs:
  - Mozy – \$4.95/month.
  - Carbonite – \$8.25/month.
  - ZipCloud – \$9.95/month.
- You can compare several cloud services at this Web site: <http://online-backup-services-review.toptenreviews.com>

### **A variation: online syncing**

- An *online syncing* service permits you to back up a folder or drive in real-time to a cloud-based service.
- When you add, delete, or change a file in the drive, the changes are reflected in the cloud immediately and automatically.
- Further, other computers can attach to the same cloud-based folder or drive; any changes to the folder or drive on one computer are reflected on the other computers immediately and automatically.

- Example: Dropbox.
  - 2GB of storage + 0.5GB per referral (18GB max) – Free.
  - 100GB – \$9.99/month.