

**Sun City Summerlin Computer Club
Seminar**

**Backup Tools
2025**

**Tom Burt
September 25, 2025**

Seminar Agenda

- **Basic Backup Concepts**
- **Cloning vs Imaging**
- **Sampling of Backup Tools**
- **Where to Back up?**
- **Where to Buy Backup Hard and Flash Drives**
- **Ransomware Considerations**
- **Example: Imaging with Free Macrium Reflect**
- **Cloud Backup for Data Files**
- **Tom's Backup Guidelines**
- **Web Site Links – Where to Buy**

Basic Backup Concepts

- “Backing up” means *making a copy* of all or part of your PC’s hard drive or solid-state drive to another hard or flash drive.
- **Why do it?**
 - Hard drives are electro-mechanical devices – they **BREAK DOWN**.
(but hard drive MTBFs are now 100,000+ operating hours)
 - Even solid-state drives can fail, become corrupt or “wear out”.
 - Drives, their folders and files can become **CORRUPT**.
 - Humans are fallible!! Sooner or later, you will **DELETE** or overwrite a file when you didn’t mean to.
 - Malware of all kinds may attack your PC and **DESTROY** data.
 - Lightning may strike, fires happen, floods happen.
- **Without backups, you may lose irreplaceable data.**
 - Family photos, music, videos, financial records, e-mail, ...
- **Replacing lost software apps may be difficult and expensive.**

Cloning vs Imaging

- **Cloning**
 - Backs up one *entire* drive to another entire drive.
 - The resultant drive is bootable – same OS & drivers.
 - The resultant drive has all the files and folders of the original.
 - The “clone” is a logical copy – not a bit-for-bit physical copy.
- **Imaging**
 - A disc image is a single large file on NTFS, or a group of files on FAT32.
 - An image is a copy of one or more *partitions* of a drive.
 - Images are compressed – normally about 2 to 1.
 - Images only contain “used” areas of the original partition(s).
 - A large backup drive can hold *multiple* disk images.
 - Images are not directly bootable but contain all boot information.
 - With software help, a disk image can be “mounted” as a logical drive. (This allows individual files to be retrieved from the image).

A Sampling of Backup Tools (1)

- **Macrium Reflect 8 – *FREE Edition (I still use this)***
 - https://www.majorgeeks.com/files/details/macrium_reflect_free_edition.html
 - No longer supported by Macrium but works fine on Windows 11.
 - Can back up an entire drive or specific partitions.
 - Supports both cloning and imaging.
 - Can “mount” a backup disk image as a logical drive.
 - Includes a bootable “Rescue disk” or “Rescue flash drive”.
- **Macrium Reflect Home (Paid version)**
 - <https://www.macrium.com/products/home>
 - Single PC subscription about \$50/year.
 - Excellent for backing up entire hard drives or partitions.
 - Makes both “clones” or “images”.
 - Can “mount” a backup image as a logical drive.
 - Can make a bootable “Rescue disk” or “Rescue flash drive”.

A Sampling of Backup Tools (2)

- **EaseUS ToDo Backup FREE**
 - <https://www.easeus.com/backup-software/tb-free.html>
 - See feature comparison on website (free vs paid)
 - Makes “images”. You can “boot” from an image.
 - You can upgrade to a fuller-featured “Home” edition for \$40 or a “Enterprise” edition for \$49.
 - *One-time fee. Not an annual subscription.*
- **Comments:**
 - I’ve tried using EaseUS ToDo Backup to back up my C: drive to a USB 3 external 7200 RPM hard drive.
 - It required 52 min to back up 300 GB of data. The resultant image size was 184.5 GB. There were a substantial number of MP4 files on the C: drive that were already compressed.

A Sampling of Backup Tools (3)

- **Acronis True Image Home (Paid)**
 - <https://www.acronis.com/en-us/#home>
 - Single PC about \$50.
 - Excellent for backing up entire hard drives or partitions.
 - Also, can back up individual files.
 - Makes both “clones” or “images”.
 - Can “mount” a backup image as a logical drive.
 - Can make a bootable “Rescue disk” or “Rescue flash drive”.
- **CASPER by Future Systems Software (Paid)**
 - <https://www.fssdev.com/products/casper/>
 - Supports both cloning and disk imaging.
 - Can make a bootable external drive that will run your system.
 - Features SmartClone technology (differential clones).
 - Single system price about \$60.

A Sampling of Backup Tools (4)

- **Windows 10 / 11 Built-in Backup (Free)**
 - Windows 11 Backup (Windows 7) FREE (built-in to Windows 10 and 11).
 - This backup tool is reached via Control Panel > All Control Panel Items > Backup and Restore (Windows 7).
 - You can use it to back up key library folders or you can choose to “Create a system image”. Once there you can choose to add additional drives or partitions to the basic C: drive partition set.
 - I set it up and let it run to make an image of my C: drive (300 GB of data). It ran for 92 minutes. The final image file size was 300 GB; there was NO compression.
- **Windows File History (built-in to Windows 10 & 11) – See upcoming slide.**
 - Automatic scheduled backups of a designated set of folders to an external hard or flash drive.
 - Excellent for backing up files / folders that change frequently.
- **Windows File Explorer (built-in to Windows 10 & 11)**
 - Built-in Windows File Manager.
 - Easy to use for ad-hoc copying small groups of files and folders.

Where to Back Up?

- **To an external disc drive (USB 3.0/3.1/3.2 or to a rack / tray mounted drive)**
 - Fastest I/O, especially for cloning or imaging.
 - Backup drive can be removed after backup is complete.
 - If imaging, can use an “images” folder on the external drive.
(No need to dedicate the entire drive to backups).
- **To a USB flash drive or plug-in memory card**
 - Fast I/O to a solid-state device.
 - No external power needed.
 - Capacities now up to 1 TB.
- **To another computer on your home network**
 - Similar to imaging to a USB backup drive.
 - Dedicate an area on that PC to storing backup images.
 - Best over a 1 Gigabit LAN.

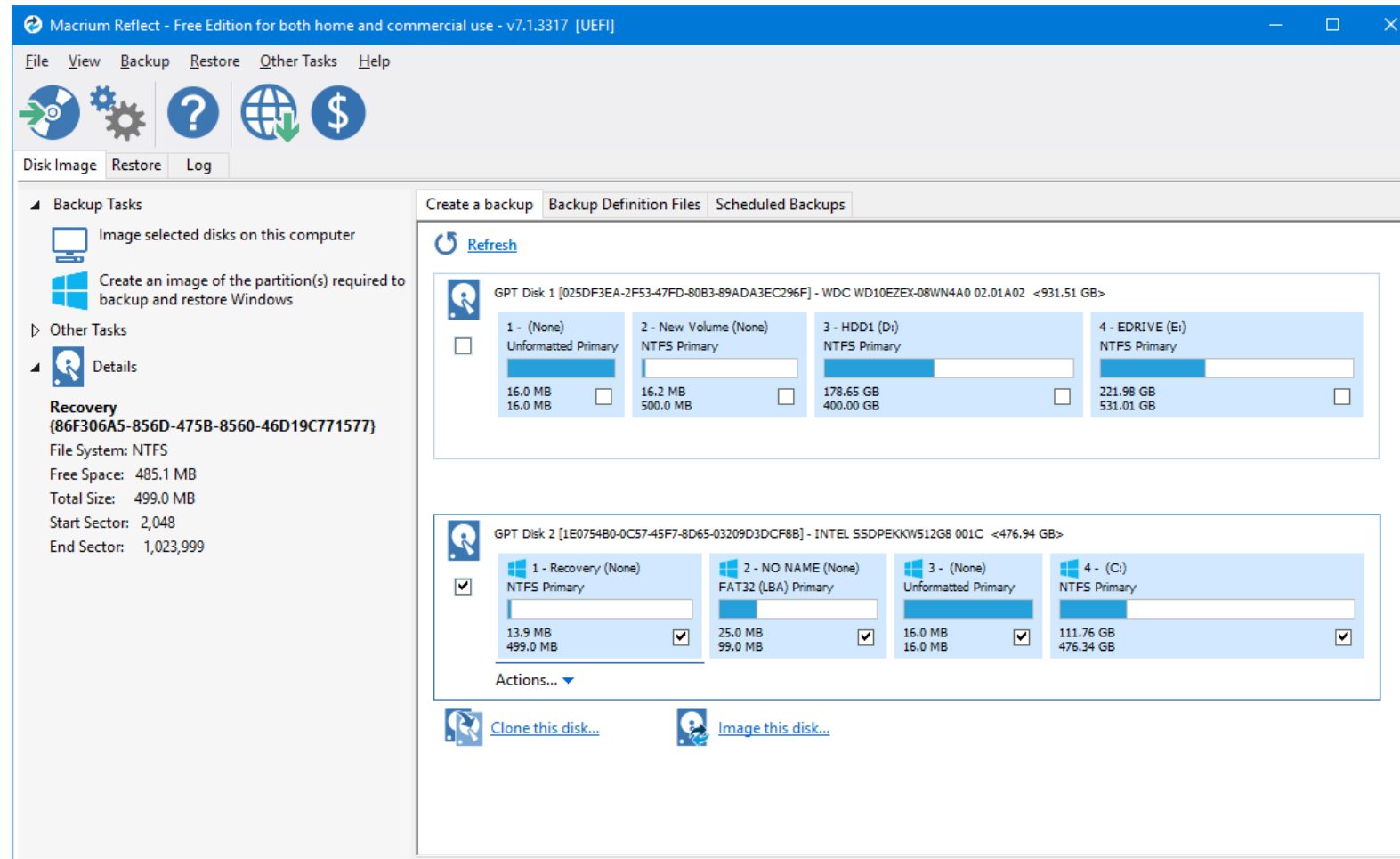
Where to Buy a Back Up Drive

- Shop the usual on-line tech stores:
 - www.amazon.com
 - www.newegg.com
 - www.walmart.com
 - www.bestbuy.com
 - www.officedepot.com
- Search Google, Bing or DuckDuckGo for a specific brand / size:
 - “external drive” “usb 3” 2-tb
 - Lots of hits – typical price about \$75 for a 2 TB disc drive.
 - New external solid-state drives may be faster.
- For just backing up data files, consider a USB flash drive
 - USB 3 64GB, 128GB, even 1 TB drives/cards quite affordable.
 - PNY 256GB USB 3.2 flash drive costs about \$20 at Walmart.
 - **DON'T buy cheap “brand-X” drives for backup!**

Ransomware / Malware Considerations

- **Ransomware** is a virus infection that encrypts (scrambles) your PC's files and then demands a ransom in exchange for the decryption key / tool.
- Ransomware scrambles files on **any attached disk drives**, including mapped network drives.
 - Files on attached backup drives are at risk.
 - Files in cloud folders on your PC are at risk.
- Best to frequently make a separate manual backup of essential / important data files.
- Important!! Do a virus scan before making a clone or image backup.
 - Don't want to back up an infected hard drive.

Main Screen – Macrium Reflect 8 Free



Example: Backing Up With Macrium

“Within Windows” Method (much more convenient)

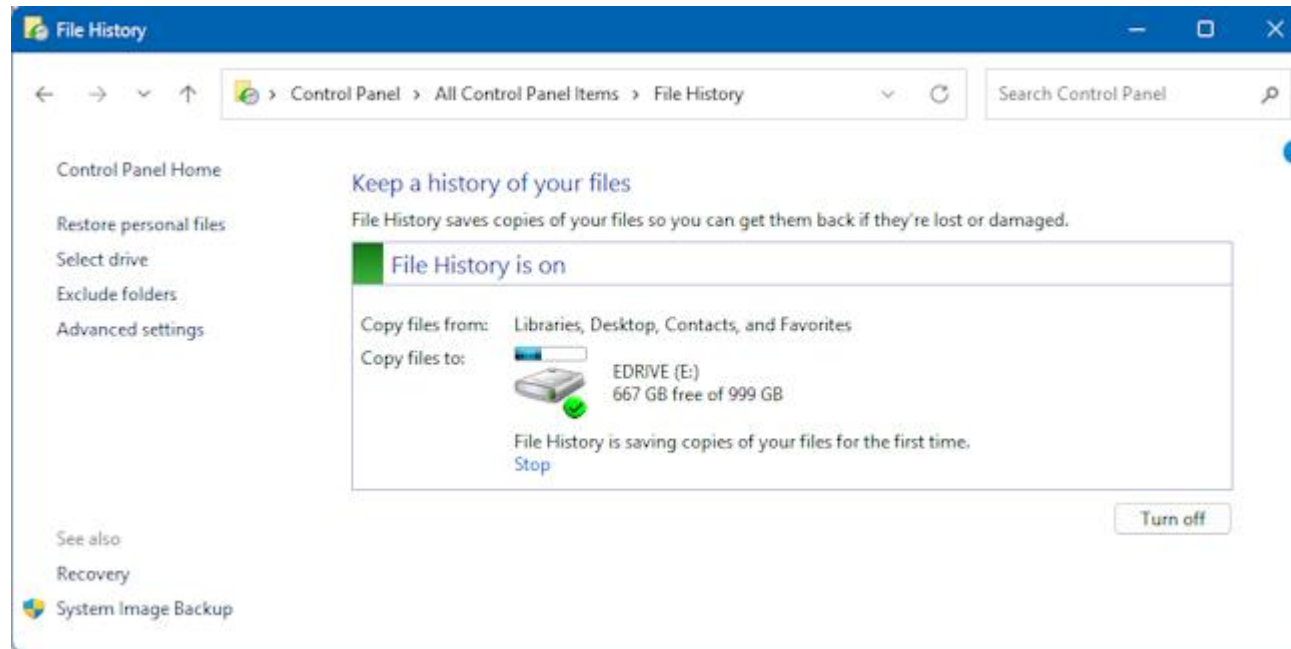
- **Attach external USB drive or mount rack with backup drive.**
- **Close any running programs (don't want open files during backup).**
- **Launch Macrium Reflect.**
- **Choose backup Options:**
 - **Clone or Image**
 - **Source partition / drive**
 - **Target partition / drive**
 - **If imaging – full or incremental, scheduled or one-shot**
 - **Name for your backup image file (or use default)**
- **Review your selection and click “Finish”.**
- **Sit back and let the backup take place.**
- **Safely Remove the backup hard drive and put it away in a safe place.**

Macrium Reflect Tools and Features

- **Make bootable rescue media (DVD or flash drive).**
 - Use to restore a backup image.
 - Can also boot and make clones or images.
- **Mount a backup Image as a logical drive.**
 - Mounted image is read-only; can't be permanently altered.
 - Useful if you need to recover a specific file.
 - Useful if you want to check file dates or other information from an earlier time.
 - Paid versions allow a backup image to be used as a virtual disk in a virtual machine.

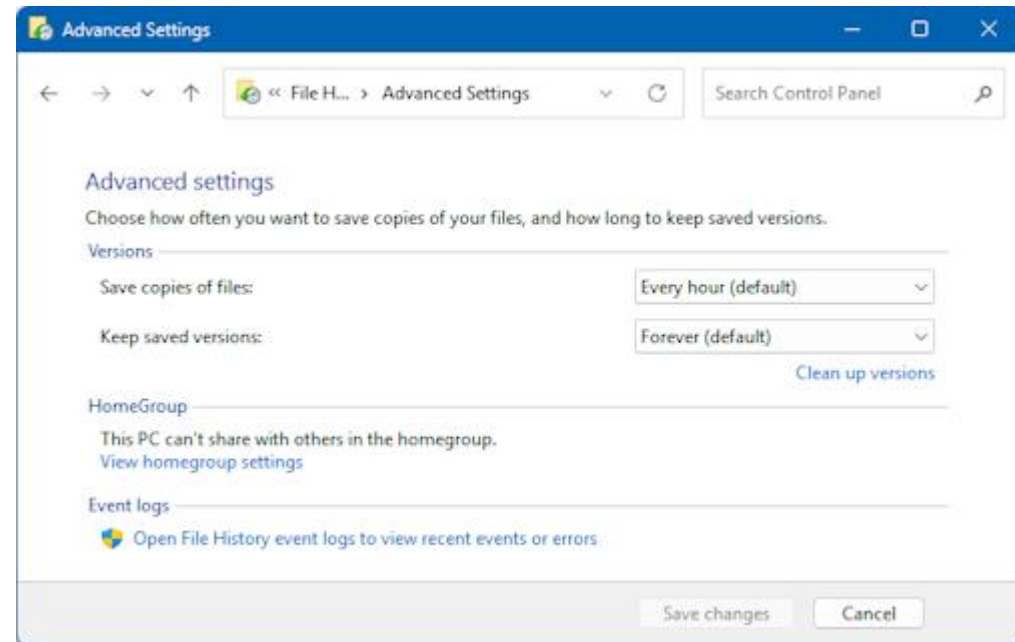
Windows File History (1)

- Available in Windows 10 Settings and Windows 11 Control Panel
 - Backs up a user-specified set of folders to an external drive.
 - Keeps multiple versions of files as they evolve.
 - Run frequency can be scheduled – default is once an hour.
 - Only backs up **new** or **changed** files.
 - Must be turned on and then configured via Control Panel > File History



Windows File History (2)

- **Insert external USB flash drive or SD card**
 - This will remain permanently mounted.
 - Recommend 64GB or larger capacity.
- **Click “Advanced Settings” to configure Windows File History:**
 - Specify the frequency of backups.
 - Specify how long to keep.
 - Add specific folders to the list.
- **Once things are set up, you just forget about it.**
- **You can temporarily remove the backup drive if you need to use that port / slot for something else.**
 - File history will cache any backups in a dedicated area of your hard drive until the backup drive is re-inserted.



Cloud Backup for Key Data Files (1)

- Popular cloud storage services are another way to regularly and automatically back up your key data files. Here's a review article:
 - <https://www.cloudwards.net/award/best-online-backup-services/>
- Most will automatically sync between your PC / Mac / Tablet and the cloud.
- Typically, you can sign up for 5 to 15 GB of free storage and buy more if needed.
- The cloud services also back up end-user files stored there.
- Popular services (free and paid) include:
 - Microsoft OneDrive: <https://onedrive.live.com/>
 - Apple iCloud: www.apple.com/icloud
 - Google Drive: <http://drive.google.com>
 - DropBox: www.dropbox.com
 - Carbonite: <https://www.carbonite.com/>
 - TotalDrive: <https://www.totaldrive.com/>
- Risks of cloud storage:
 - Backups take a long time due to slow Internet upload speeds.
 - Services can change or even go out of business.
 - Prices tend to rise over time.
 - Cloud data can get hacked or subpoenaed.

Cloud Backup for Key Data Files (2)

- **Google Cloud (Google Drive) - FREE**
 - <https://drive.google.com/drive/u/0/my-drive>
 - Requires a Google / Gmail account
 - 15-17 GB of free cloud storage
 - Install Google Drive app (Windows / MacOS)
 - Specify a set of folders to be monitored and backed up to the Google Cloud whenever a change is detected.
 - Gemini prompt: *“What are the latest rules for Google Drive cloud storage?”*
- **Microsoft OneDrive - FREE**
 - <https://onedrive.live.com/about/en-us/>
 - Requires a Microsoft Account
 - 5 GB free (1 TB free if subscribed to Microsoft 365)
 - Syncs from a OneDrive folder on your PC or device to your OneDrive cloud storage.

Tom's Own Backup Methodolgy

- **Use Macrium Reflect 8 Free for Image Backups**
 - Monthly for OS partition (SSD C: Drive)
 - Monthly for separate Tom_Data partition (HD E: Drive)
 - Back up to a USB 3 removable hard drive dock with a 2 TB bare SATA 3 drive (can unplug and put away afterward).
- **Also use MS OneDrive to back up key files that change daily.**
 - Folders to be backed up kept in PC's OneDrive folder.
 - Can easily sync between desktop and laptop PCs and Android phone.
 - I use a Windows command script (.cmd file) to automate copying files to OneDrive.
- **Also occasionally explicitly burn & file DVD backups of some data**
 - Tax returns & supporting files.
 - Medical records.

What About Smart Phones?

- **Topic for another class:**
 - Android phones automatically sync various settings, photos and videos to Google Drive.
 - Apple phones automatically sync various settings, photos and videos to iCloud.
 - You can connect your phone to your PC via its charging cable and turn on “File Transfer” mode.
 - Once that’s done, you can use your PC/mac file manager to copy files/folders to/from Your phone.
 - Various third-party apps can facilitate making backups.

Web Links – Where to Shop

- <http://www.acronis.com>
- <https://www.macrium.com>
- <http://www.fssdev.com>
- <http://www.newegg.com>
- <http://www.amazon.com>
- <http://www.Walmart.com>

Questions and Answers