

Backups

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Thanks to Tom Burt

Basic Backup Concepts

- "Backing up" means *making a copy* of all or part of your PC hard drive to another hard drive.
- Why do it?
 - -Hard drives are electro-mechanical devices – they **BREAK DOWN**.
 - -Hard drives, their folders and files can become **CORRUPT**.
 - -Humans are fallible!! Sooner or later you will **DELETE** 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 may be difficult and expensive.

Simple Backup

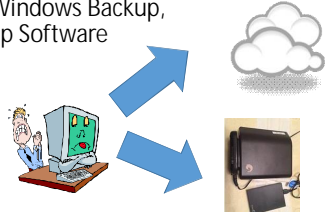
e.g. Carbonite, Windows Backup, File Back up Software

- Why
 - To help protect **DATA** against viruses such as CryptoLocker
- Will **NOT** Protect against
 - Disk Failure
 - Disk Corruption
 - Viruses that take over Windows

Simple Backup

e.g. Carbonite, Windows Backup,
File Back up Software

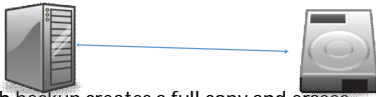
- Only Data
- Pictures
- Music
- Etc
- No Programs
- No Windows



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Clone (e.g. Casper)

- Duplicates the Computer's Disk
- In Case of drive failure, the cloned drive can replace the computers failed drive



- Each backup creates a full copy and erases the previous copy
 - Cloning requires a disk at least as large as the original
- Can be used to restore individual files/folders

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Image

- Duplicates the Computer's Disk Information
- Can be generated by *Windows* or Backup Software such as *Casper*, *Macrium* and *Acronis*
- Requires a bootable CD to copy the data back on the original or replacement Drive
- Each Image is significantly smaller than the drive being backed up
- You can save multiple images on a drive



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Full Backup

- Full Backup is similar to an image but:
- Can only be generated by Backup Software such as *Macrium* and *Acronis*
 - Can be used as starting point for incremental copies
 - Is usually stored in a compressed format which takes less space than the disk being backed up
- You can restore the full disk or only selected files/folders
 - Requires a bootable CD (Rescue/Emergency Disk) to copy the full disk back on the original or replacement Drive
 - Non-System files can be restored from a running system

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Basic Recommendation

- For all but Cloning, you need an external, USB Backup Hard drive
 - If your hard disk fails, you have to purchase a replacement disk
- For Cloning, you need an internal hard drive and a USB-SATA adapter
 - You can use the cloned drive as a replacement
 - To continue backing up, you have to buy another hard drive
- You Also need backup software such as *Casper*, *Macrium* and *Acronis*
 - If the disk is not damaged, you can restore from a bootable CD
 - If the disk is damaged, you have to come to the HW Sig to repair computer
 - Unless you are able to replace components inside the computer

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Basic Recommendation

- The simplest backup approach is cloning
 - Each backup takes the same amount of time
 - You can only have one clone of the system drive
 - You need software such as *Casper*
 - *Simplest/easiest operation*
- The next simplest backup approach is Imaging
 - Each backup takes the same amount of time
 - You can multiple images of the system drive
 - Each image is significantly smaller than the original hard drive
 - Easy from Windows 7 or using *Casper*
 - Windows 8, a little more complex

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Basic Recommendation

- Definitions:
 - Full back up** = Windows, Programs and data contained on the computers' disk.
 - Incremental** = Only the items which have changed since the last backup
 - Uses very little disk space
 - Runs fairly fast
 - If any incrementals are bad, restore fails
 - Differential** = Only the items which have changed since the last full backup
 - Uses little disk space
 - Runs fairly fast
 - Failed differentials still allow restore
- Backup Software such as Acronis and Macrium are the most complete method and fairly easy to use
 - You can create Full backups with multiple incrementals/differentials
 - You can set a schedule to have the backups run automatically
 - You can have more frequent backups of just your selected folders
 - Your data/pictures/music/etc
 - You can restore selected data files while your system is running
 - You can mount backups as pseudo disks and access the data or copy to your disk
 - You can generate a Bootable CD to restore Windows plus your programs
 - Your backup schemes can be as simple or complicated as you care to make them

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Backup Software

- Windows 7 System Image
 - Control Panel/Backup/System Image
- Windows 8 System Image (Command line only)
 - WIN+X
 - Command Prompt (admin)
 - Recimg /createimage <directory>
- Casper Clone or Image
 - <http://www.fsdev.com/>
 - \$ 50
- Acronis Full backup software
 - <http://www.ugr.com/>
 - \$ 25
- Macrium Reflect Free backup software
 - <http://www.macrium.com/reflectfree.aspx>
 - \$ 0

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Backup Hardware

• Costco

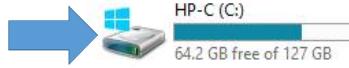
• Fry's

• Note: 1TB = 1,000 GB (GigaBytes)

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What Size Backup?

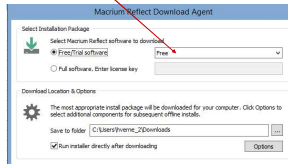
- Double Click on *Computer*
 - On Desktop or
 - In Start Menu
- Find Entry for System "C" Drive
- For Example:
 - Amount used,
 - = Total (127) - Free (64.2)
 - = 63GB Actually Used
 - For Clone/Image
 - 100 GB Minimum Drive
 - For Full Backups
 - (4*63) = 500 GB more than adequate



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
Macrium Reflect Backup - 1

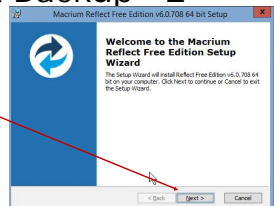
- Download from
 - <http://www.macrium.com/reflectfree.aspx>
- Install and Run Program
- Make Sure you have Selected Free
 - Click Download



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Macrium Reflect Backup - 2

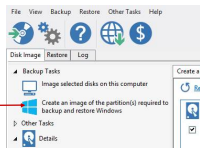
- When the Setup Wizard screen appears
 - Click Next
- Accept License
- If you wish, Enter Registration Info
- Accept Custom Setup Screen
- Click Install
- When Install is finished, a popup will appear, Click Finish
- A Reflect Icon  will appear on your Desktop
- Double Click on Icon to Start Program
 - If you do not wish to register, click on 



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Macrium Reflect Backup - 3

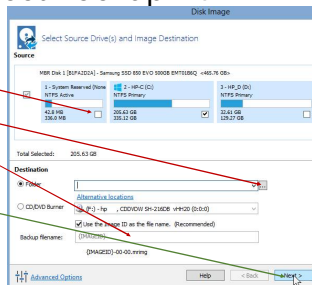
- Plug in Backup Drive
 - Note the drive Letter Assigned to this drive
- Click on 



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Macrium Reflect Backup - 4

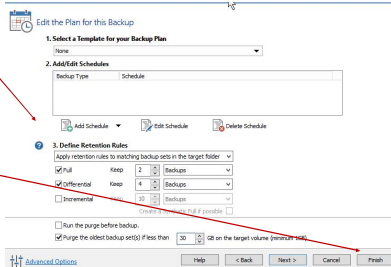
- Make Sure "System Reserved" partition is checked
- Click on Browse Button
 - Select Backup Drive
- If you wish, change Backup File Name
- Click on Next



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Macrium Reflect Backup - 5

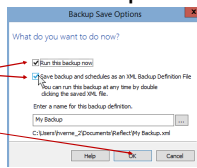
- Setup Backup Plan as shown:
- Click Finish



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Macrium Reflect Backup - 6

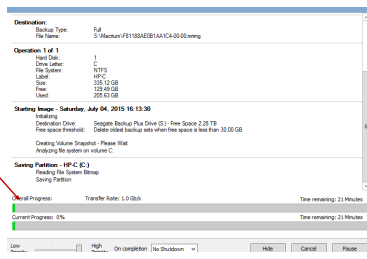
- Save your Backup Plan
 - And run backup
- Click on OK
- Backup will Start



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Macrium Reflect Backup - 7

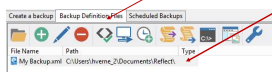
- Will Show Backup Summary
- Click on Proceed
- Backup will Start
 - Estimated time is worthless!



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Macrium Reflect Backup - 8

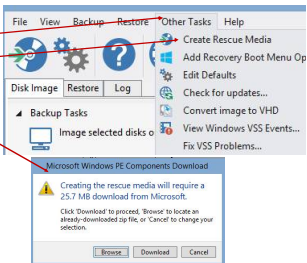
- For Subsequent Backups
 - Select Backup Definition Files Tab
 - Double Click the one used for the original backup
 - Select Finish



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Macrium Reflect Backup - 9

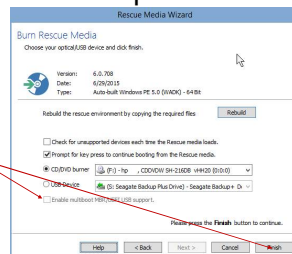
- Make a Recovery CD
 - Click on Other Tasks
 - Select Create Rescue Media
- Keep Clicking on NEXT until you get this screen
 - Click on Download



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Macrium Reflect Backup - 10

- When you get the Rescue Media Wizard screen
 - If you have a Windows 8 or later system, click on "enable UEFI..."
 - Insert a blank DVD
 - Click on Finish



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Macrium Reflect Backup - 11

- Do NOT leave your backup unit plugged in to your system
 - Unfortunately there are viruses around which not only encrypt your files, but encrypt the files on your backup unit.
 - It is a shame, as Macrium has the ability to schedule backups.
 - However, it would be more of a shame to have a virus encrypt your files **and** the backup unit

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Any Questions??



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