

Helen Smith - U3A Nunawading

Before it's too late ...

BACKUP YOUR COMPUTER!

Credits

Web pages

- Leo Notenboom **How to Back Up Windows 10 (& 11):**
<https://askleo.com/how-to-back-up-windows-10/>
- Leo Notenboom **How Do I Back Up My Computer?**
<https://askleo.com/how-do-i-backup-my-computer/>
- Leo Notenboom **Macrium Reflect – Powerful Windows Backup Software**
<https://askleo.com/macrium-reflect-powerful-windows-backup-software/>

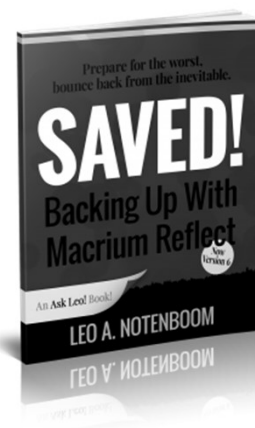
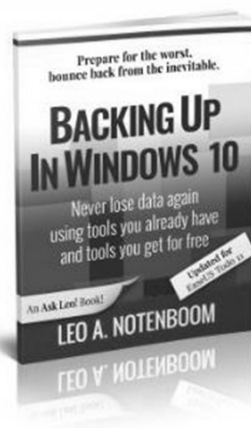
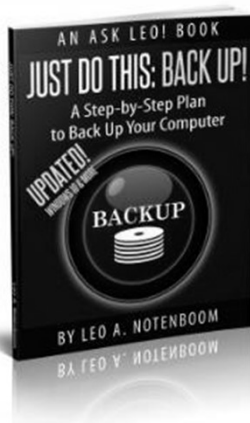
Credits

eBooks

- Leo A. Notenboom (2018) **Backing Up In Windows 10 (v1.1)** eBook available at <https://askleo.com/backing-windows-10/>
- Leo A. Notenboom (2015) **Saved! Backing up with Macrium Reflect (v6)** Edition 2, eBook available at <https://askleo.com/saved-backing-macrium-reflect/>
- Leo A. Notenboom (2018) **Just Do This: Back Up! (v1.1)**, eBook available at <https://askleo.com/just-do-this-back-up/>
- Rob & Lauren Lim (2013) **Backup or Die – How to keep your photos safe**, <https://photographyconcentrate.com/>

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Leo Notenboom ebooks



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What we'll cover

You can click the links on this page to go straight to a section

Part 1 - General

1. [Some theory about backing up](#)
2. [Get prepared – what you need and why](#)

Part 2 – Windows backup

3. [Quick view of Windows 10 backup](#)
4. [Macrium Reflect backup overview and step through](#)
5. [Rescue disk overview and step through](#)
6. [Check your backups!](#)
7. [Summary and questions](#)

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Part 1. Theory

Suitable for ALL devices – computers – including Apple - phones, tablets etc.

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Why backup? 5 Ways to Lose your Data



1. Human error – e.g. accidentally delete files
2. Malware infection – e.g. viruses or ransomware prevent you accessing your data
3. Hard drive failure – hard drives wear out! (Expected lifetime of conventional hard drive is 3-5 years)
4. Disaster – fire, flood or theft destroys or removes your data
5. Data corruption – e.g. power surges, operating system errors ...

If you've got a backup you can recover your data

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What IS a backup?

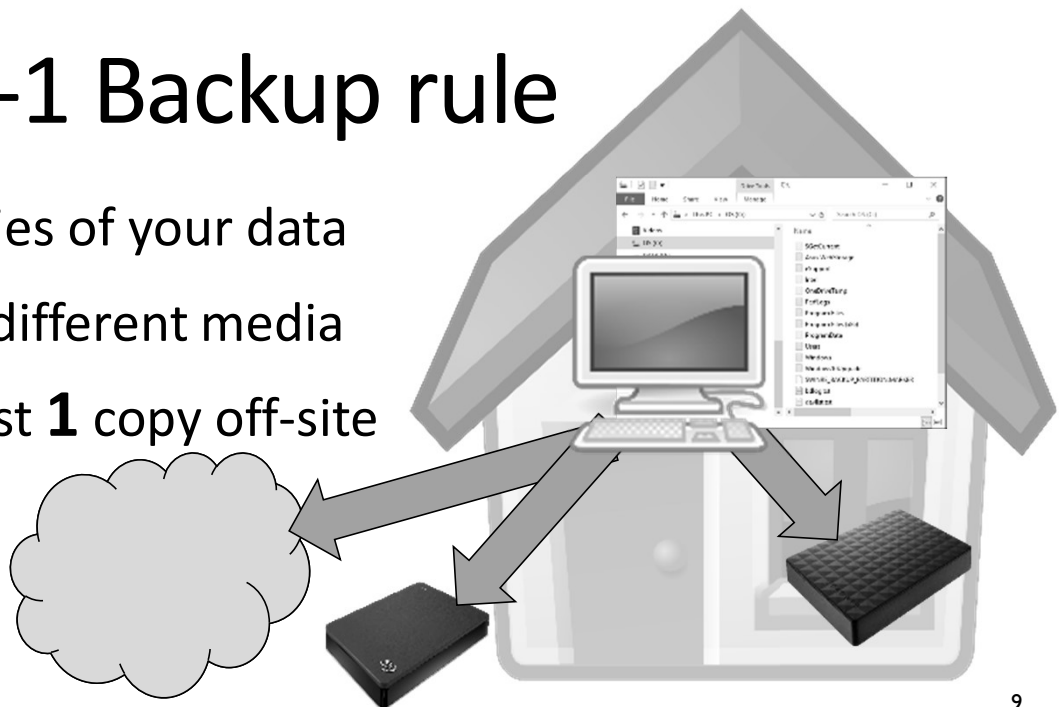
- ... a copy of a file or other item of data made in case the original is lost or damaged
- Backups capture a point-in-time snapshot that is then used to return data to its previous state.
- Any changes SINCE the backup will be lost!

It's **ONLY BACKED UP** if there are **THREE** copies of the data!

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3-2-1 Backup rule

- **3** copies of your data
- On **2** different media
- At least **1** copy off-site



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2 TYPES of backup - IMAGE Backup

- **Image backup**
 - a copy of:
 - the operating system (OS)
 - all the data associated with it, including the system state and application configurations.
 - The **backup** is saved as a single file that is called an **image**.



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2 TYPES of backup - FILE Backup

- **File backup** - copies of your (individual) files on another drive in case something happens to the originals.



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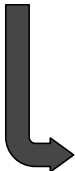
Recovering your computer – File Backup

- Find all your original software incl OS
- Install the OS
- Update all drivers
- Reinstall all software (incl registration codes!)
- Recover your files from somewhere ...



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Recovering your computer – Image Backup



- Find all your original software incl OS
- Install the OS
- Update all drivers
- Reinstall all software (incl registration codes!)
- Recover your files

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What am I protecting against?

	Lose single files	Lose all your data
Human error	X	X
Malware infection		X
Hard drive failure	X	X
Disaster		X
Data corruption	X	X
You need:	File backup	System image backup

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2. Get Prepared

What do I need in order to backup?

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You need:

- A. External storage, eg hard disk (how many, what size?)
 - Separate discs for Image and File backup is best
- B. Backup software
- C. A backup plan:
 - what to backup
 - how often to backup
 - where to store your backups

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A. External storage



1 / 2 / 4 / 5 TB Drive,
USB powered



0.5 / 1 / 2 / 4 TB SSD,
USB powered



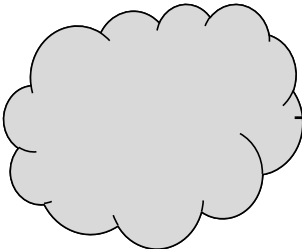
4 / 6 / 8 TB Drive,
externally powered



2 TB + Network Drive (NAS),
externally powered



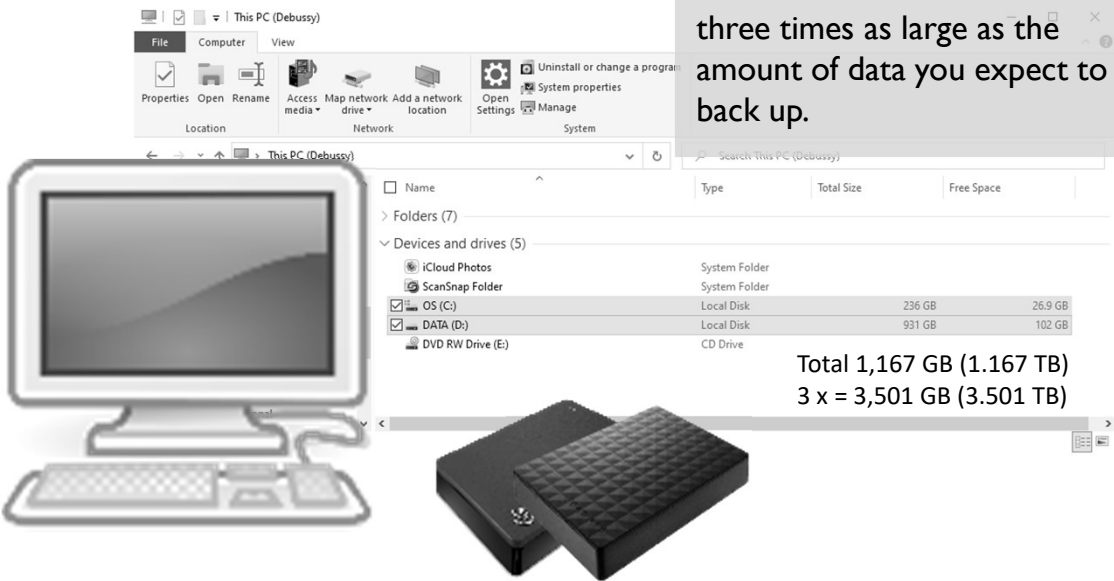
8 – 512 GB Drive,
USB powered



Cloud service account
free may not be enough
eg OneDrive
Google Drive
Dropbox etc

How large?

Leo Notenboom – [you need]
an external drive *at least*
three times as large as the
amount of data you expect to
back up.



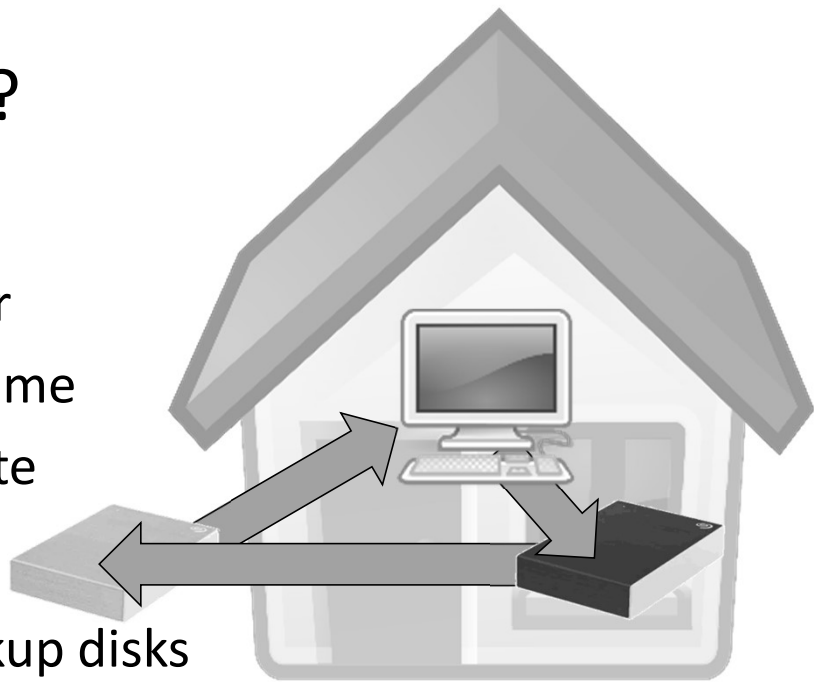
How many?

3 copies:

- 1 on computer
- 1 backup @home
- 1 backup offsite



At least 2 backup disks
... or use the cloud?



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Cloud “ backup” (Online File Synchronisation)

In addition to hard drive backups you could consider online backups, eg:

- Microsoft OneDrive
- Dropbox
- Google Drive
- iCloud

These **synchronise** your files between the computer and the ‘cloud’

- not strictly backup, particularly if you delete files.
- usually an ongoing cost involved beyond a small free amount of storage
- slower than a hard drive, but “offsite”

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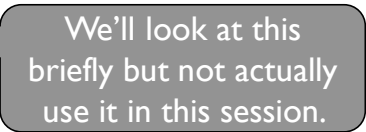
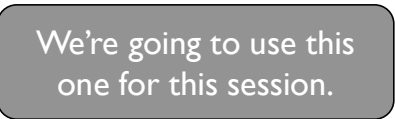
Cloud backup - Online File Backup

Real Online Backup options include:

- Backblaze (US\$5 /month /computer)
- Carbonite (from US\$6 / month)
- MozyHome (uses Carbonite)
- SugarSync (from US\$7.49 /month /unlimited devices)
- SpiderOak (from US\$5 / month)

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B. Software – For Windows, either:

- Windows backup 
 - Built-in
 - Windows 10 uses old Windows 7 version
 - Windows 10 may discontinue in-built backup
- Macrium Reflect 
 - Image backup in free version
 - File backup needs paid version

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Software – for Mac

- Time Machine is built-in
 - External storage needs to be formatted as HFS+ or APFS (OS 11)
(this is not the format the disks are normally sold in but Time Machine will reformat for you)
 - See how to backup:
 - <https://support.apple.com/en-au/HT201250>
 - <https://setapp.com/how-to/how-to-use-time-machine.apple.com/en-au/HT201250>

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C. A Plan – How often?

- Full backup each time?
- Alternatives are:
 - Incremental – all the differences from the previous full backup
 - Differential – just the differences from last time

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How much history?

- How far back do you need to go?
 - What if you have malware you weren't aware of?
 - Want a file that you deleted a couple of months ago?
- Generally, at least 3 earlier versions is good
- May mean you need larger storage!

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Apple Time Machine

Time Machine creates Image backups

- Full backup plus
 - hourly backups for the past 24 hours,
 - a daily backup for the past month
 - weekly backups for as long as there is space.
- The oldest backups are deleted to make space

<https://eshop.macsales.com/blog/32972-time-machine-what-it-is-how-it-works-and-how-to-use-it-with-your-mac/>

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3. Let's step through Windows 10

OK, that's the theory

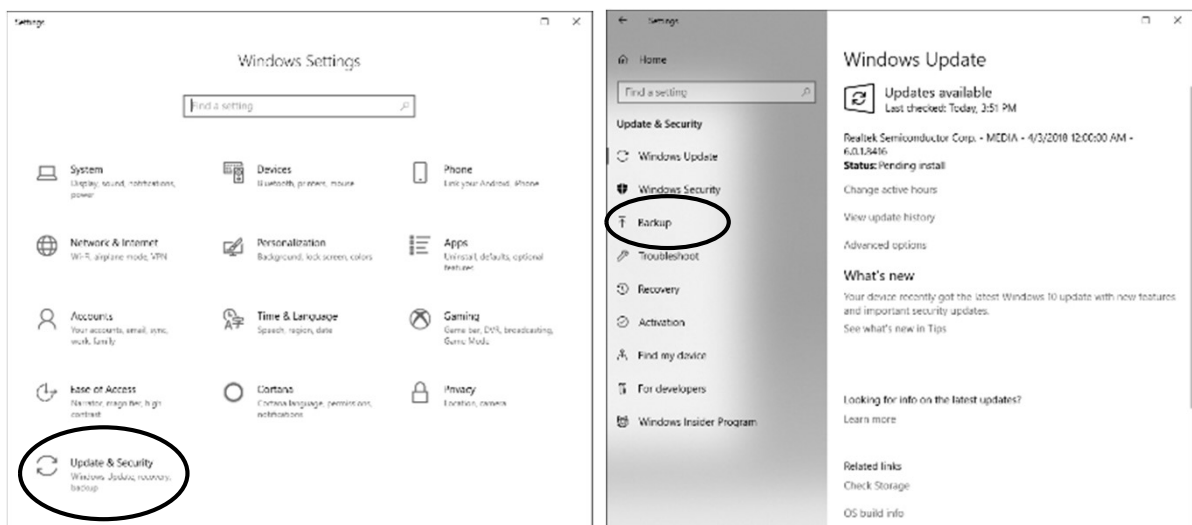
Now, how do we actually do it?

1. *Image backup of C drive*
2. *System repair disc*
3. *File backup of data drive*

Macrium Reflect version

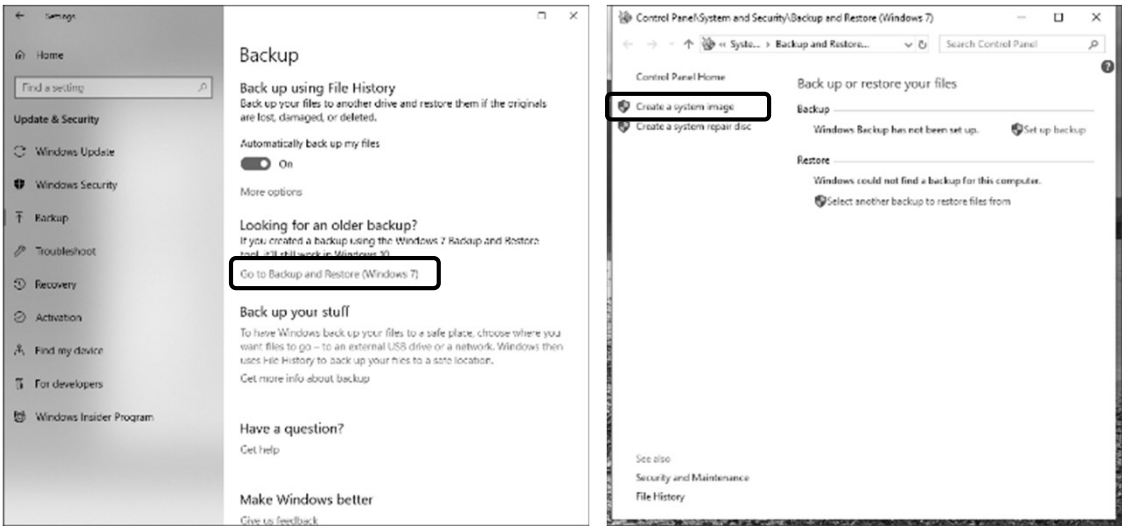
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1. Image backup – step 1



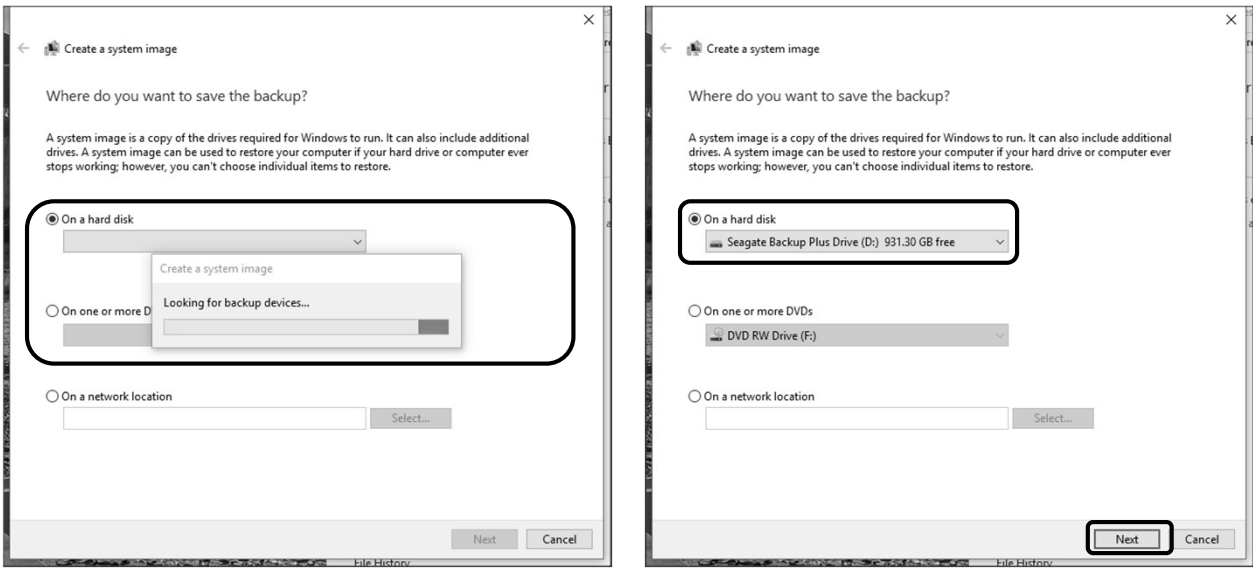
28

1. Image backup – step 2



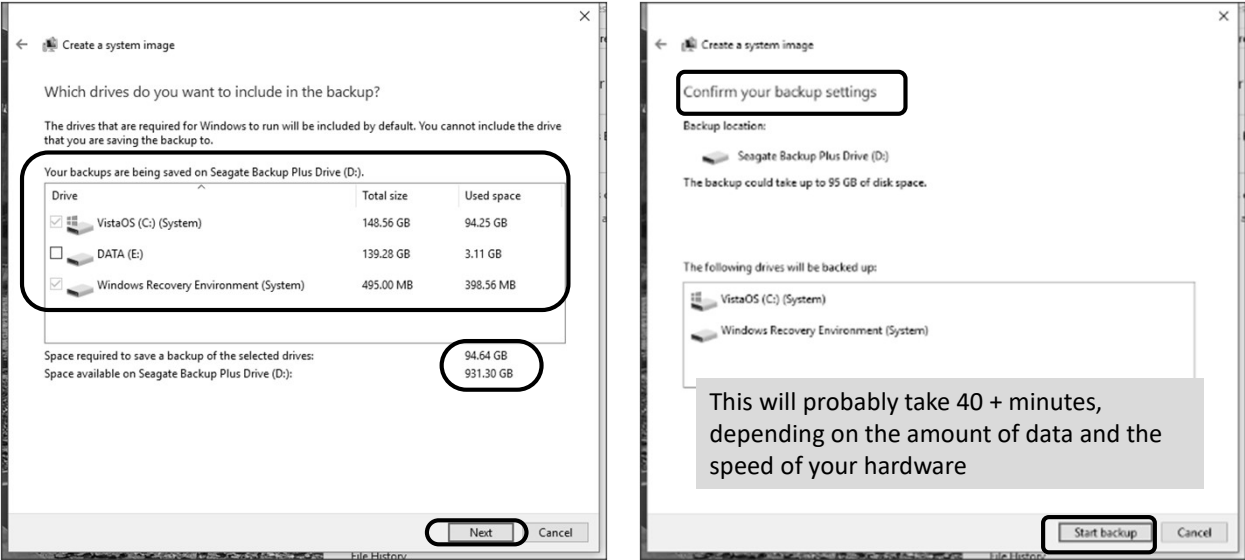
29

1. Image backup – step 3



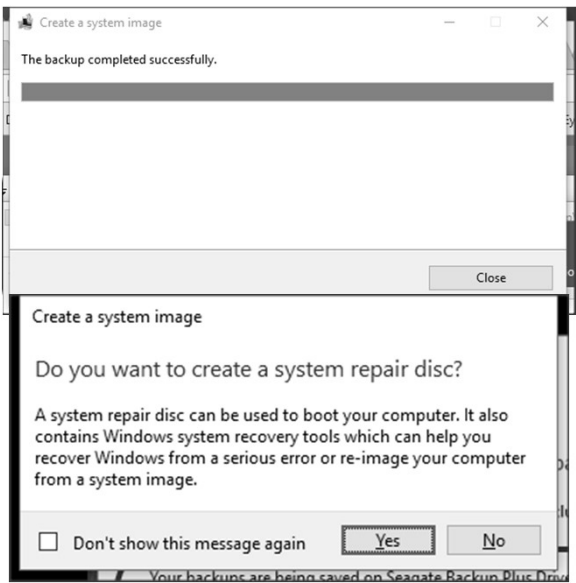
30

1. Image backup – step 4



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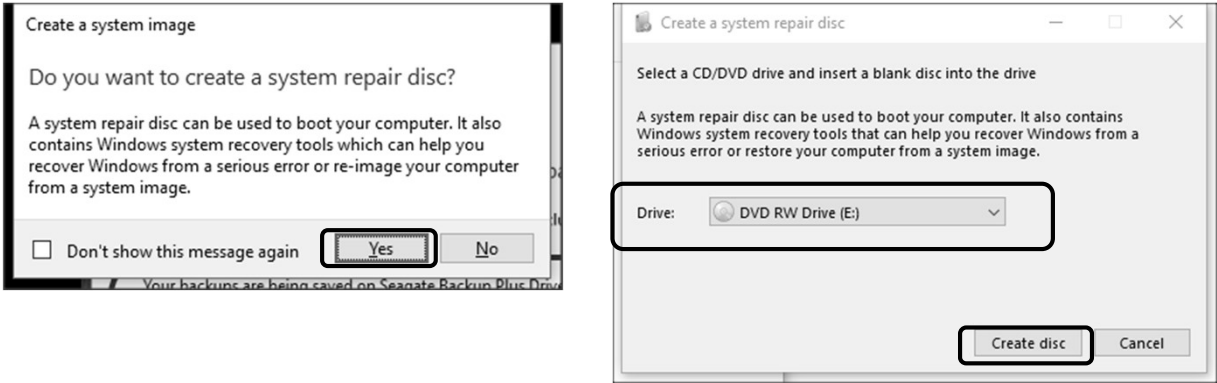
1. Image backup – step 5



Your system image has now been created.
It is best to remove this drive from your computer so that the image backup cannot be corrupted by malware etc.

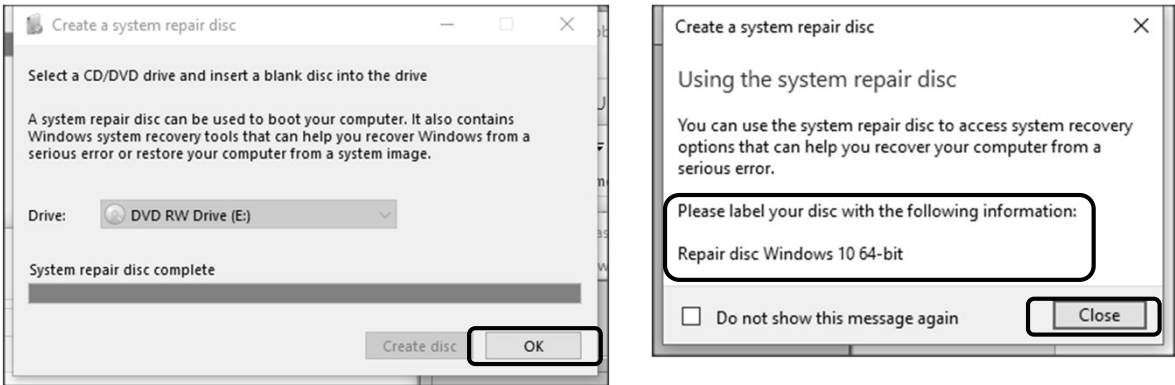
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2. System repair disc – step 1



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2. System repair disc – step 2



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3. File backup – step 1

Backup

Back up using File History

Back up your files to another drive and restore them if the originals are lost, damaged, or deleted.

Automatically back up my files

On

More options

Looking for an older backup?

If you created a backup using the Windows 7 Backup and Restore tool, it'll still work in Windows 10.

Go to Backup and Restore (Windows 7)

Back up your stuff

To have Windows back up your files to a safe place, choose where you want files to go – to an external USB drive or a network. Windows then uses File History to back up your files to a safe location.

Get more info about backup

Have a question?

Backup

Back up using File History

Back up your files to another drive and restore them if the originals are lost, damaged, or deleted.

+

Add a drive

More options

Looking for an older backup?

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To have Windows back up your files to a safe place, choose where you want files to go – to an external USB drive or a network. Windows then uses File History to back up your files to a safe location.

Get more info about backup

Have a question?

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3. File backup – step 2

Backup options

Overview

Size of backup: 0 bytes

Total space on Seagate Backup Plus Drive (D:): 931 GB

Your data is not yet backed up.

Back up now

Back up my files

Every hour (default)

Keep my backups

Forever (default)

Back up these folders

+

Add a folder

Saved Games

C:\Users\Helen

Select Folder

Organize

▼ Folders (7)

3D Objects

Desktop

Documents

Select Folder

Organize

New folder

Name	Date modified	Type
Family 2	2/12/2017 10:52 PM	File folder
Family album	2/12/2017 10:52 PM	File folder
Windows Backup	19/07/2016 3:43 PM	File folder

Folder: Family album

Choose this folder

Cancel

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3. File backup – step 3

Backup options

Overview

Size of backup: 0 bytes

Total space on Seagate Backup Plus Drive (D:) (D:): 931 GB

Your data is not yet backed up.

Back up now

Back up my files

Every hour (default) ▼

Keep my backups

Forever (default) ▼

Back up these folders

+ Add a folder

Family album
E:\

Backup options

Exclude these folders

+ Add a folder

Back up to a different drive

You'll need to stop using your current backup drive before you add a new one. This won't delete any files from your current backup drive.

Stop using drive

Related settings

See advanced settings

Restore files from a current backup

Have a question?

Get help

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4. Let's step through Macrium Reflect

- *An alternative to Windows inbuilt backup*
- *A free version is available which is adequate.*
- *Relatively easy to use.*
- *You can set up automatic backups.*

BUT

- *Free version only allows image backups, not file backups*

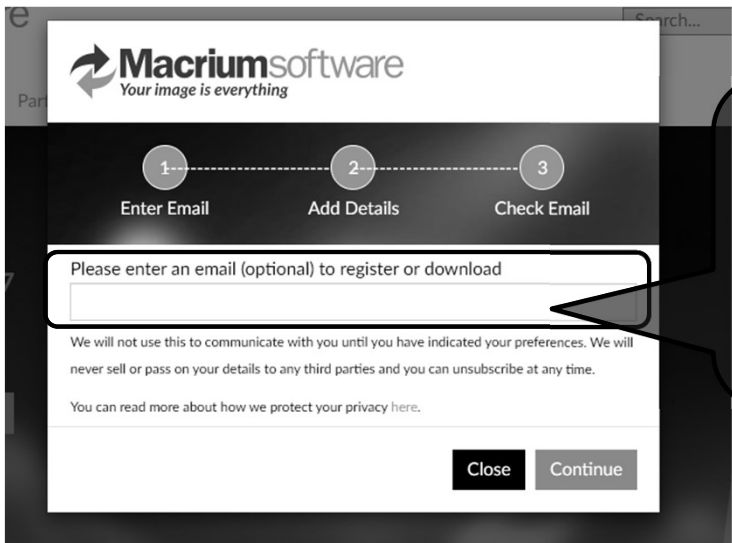
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Download Macrium Reflect



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Download step 2



It is not necessary to enter an email address.

If you do, look for the download link in the email you are sent.

You'll need to click that link for the download to start.

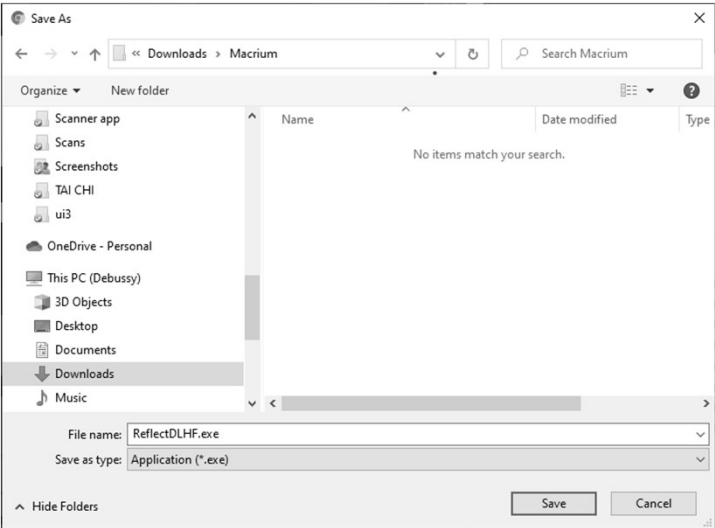
40

Download step 3

Choose the location where you want to save the installer.

I've created a folder (Macrium) inside the Downloads folder

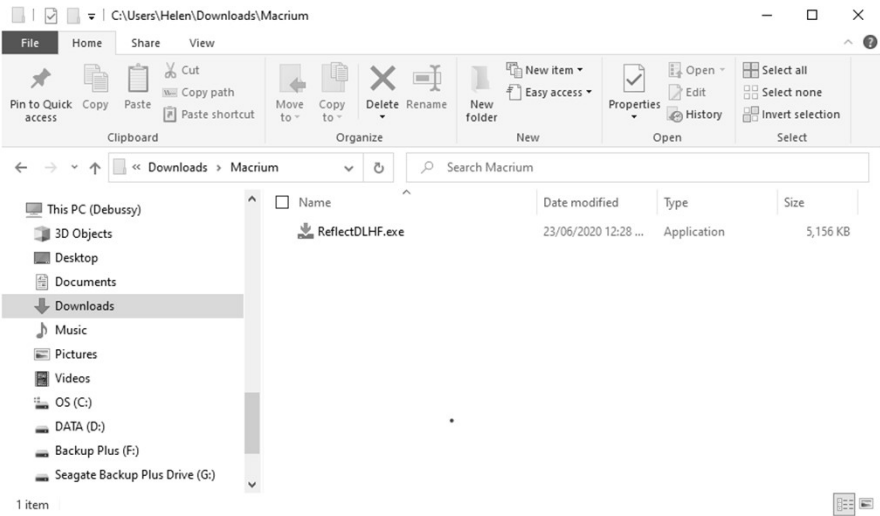
Click Save.



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Install Macrium Reflect

Find the location where you saved the Installer.



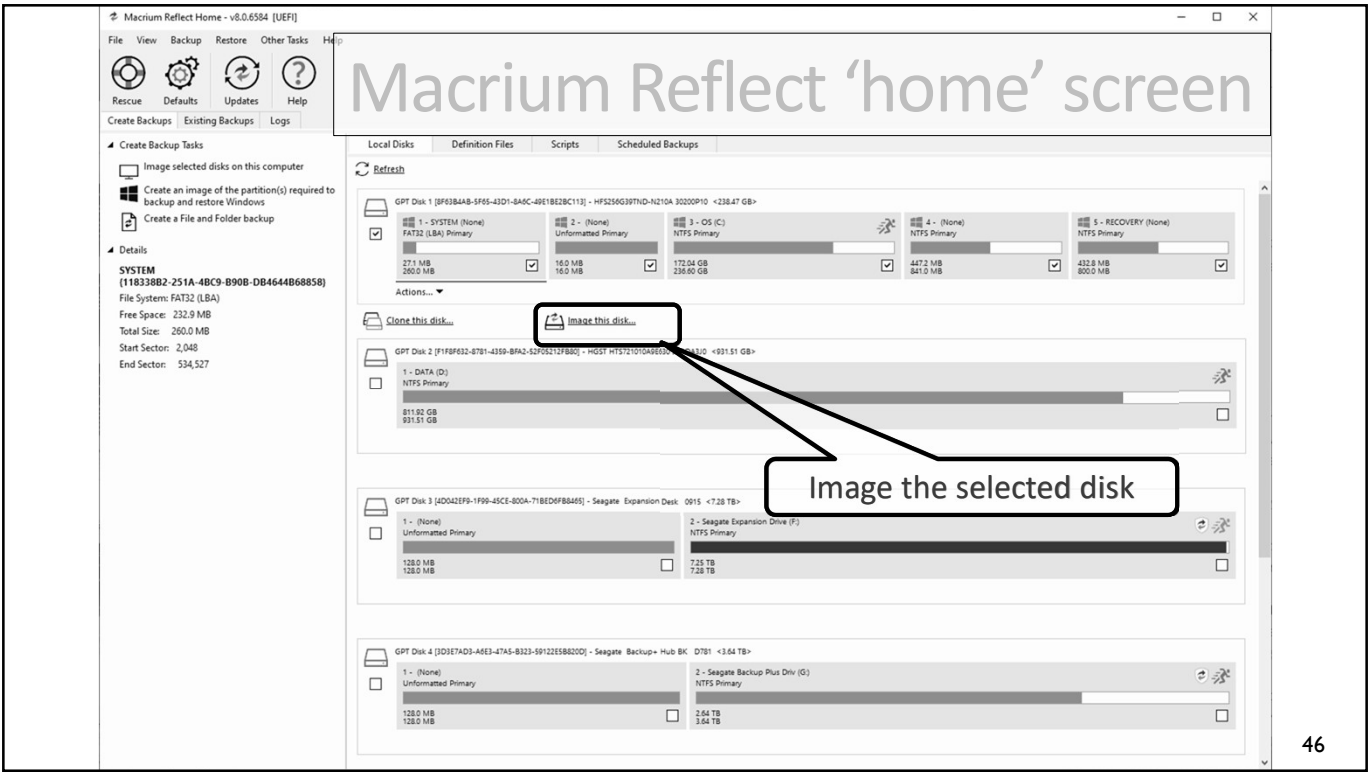
42

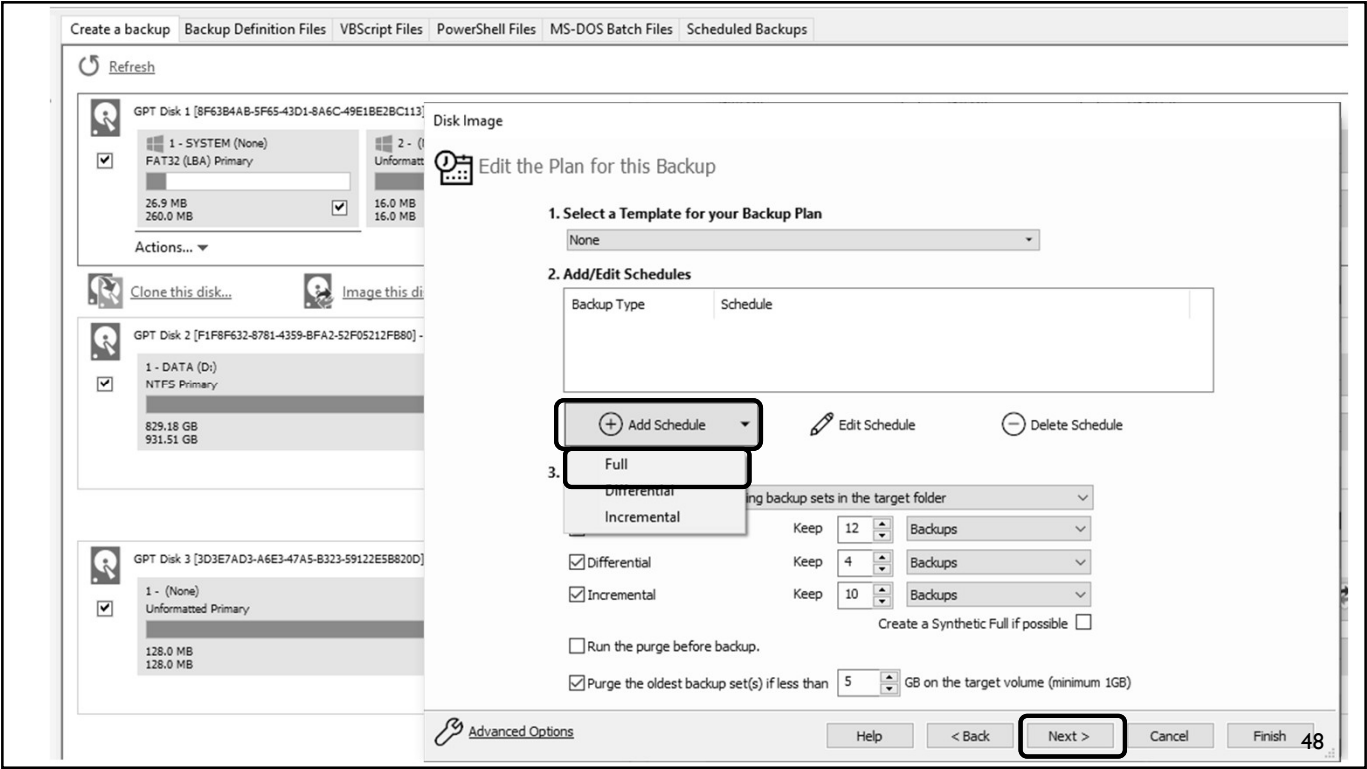
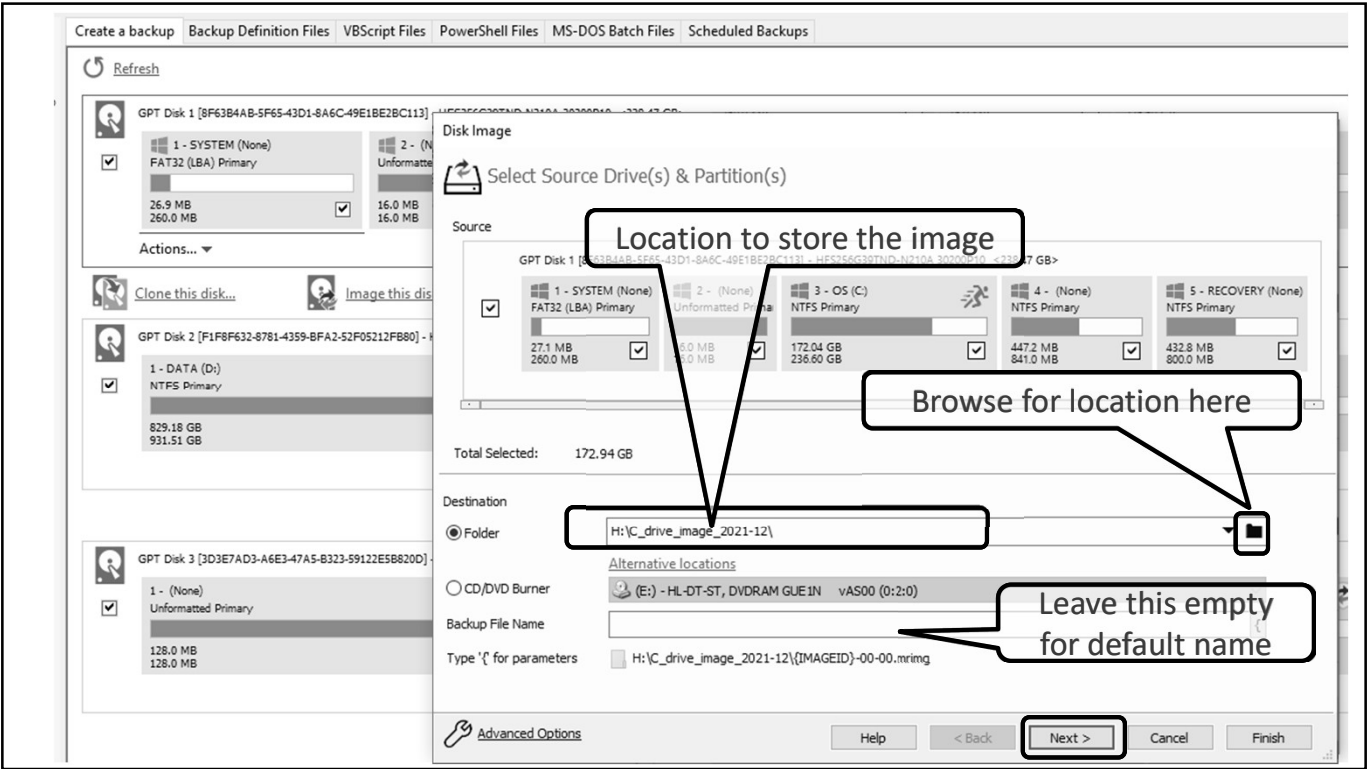
Macrium Reflect

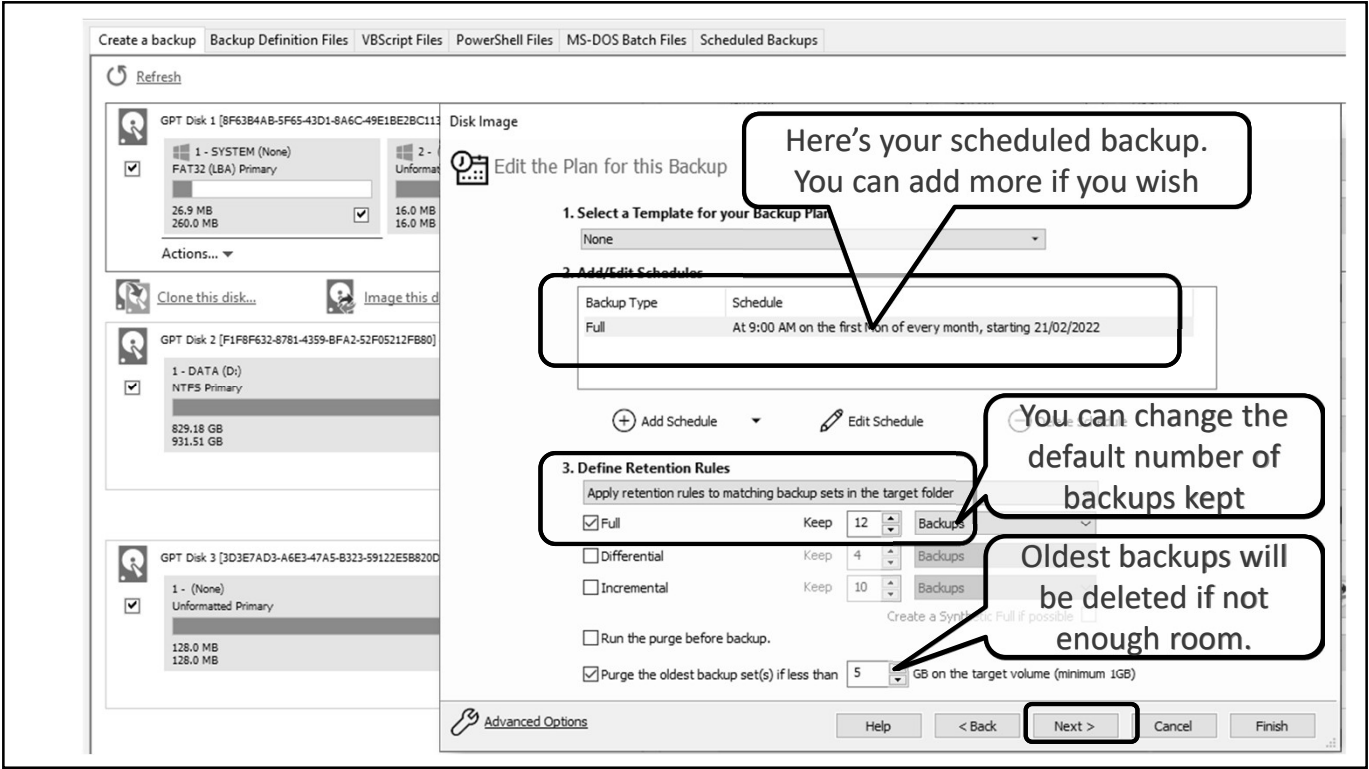
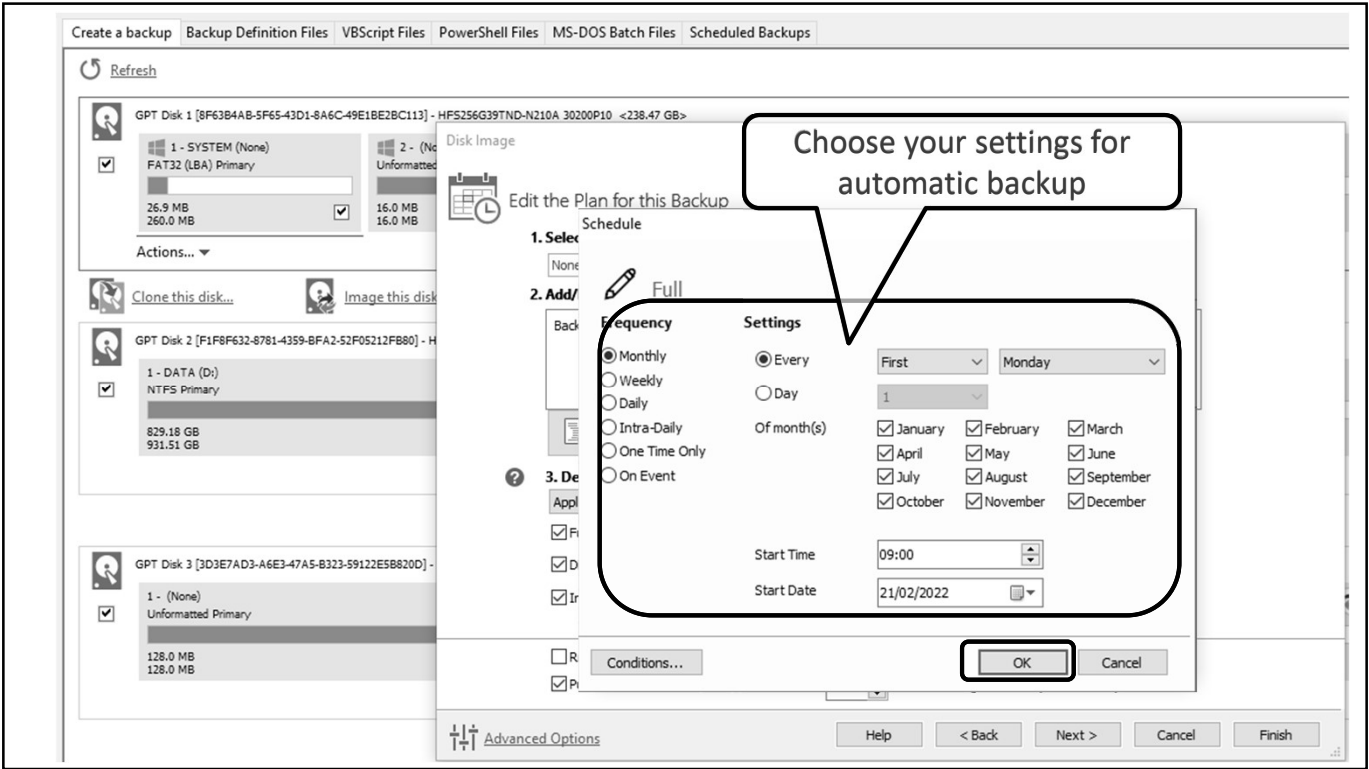
Disk Image - stores the information required to completely restore disks (or their individual partitions) exactly as they were when the image was taken. Will need software to restore it.

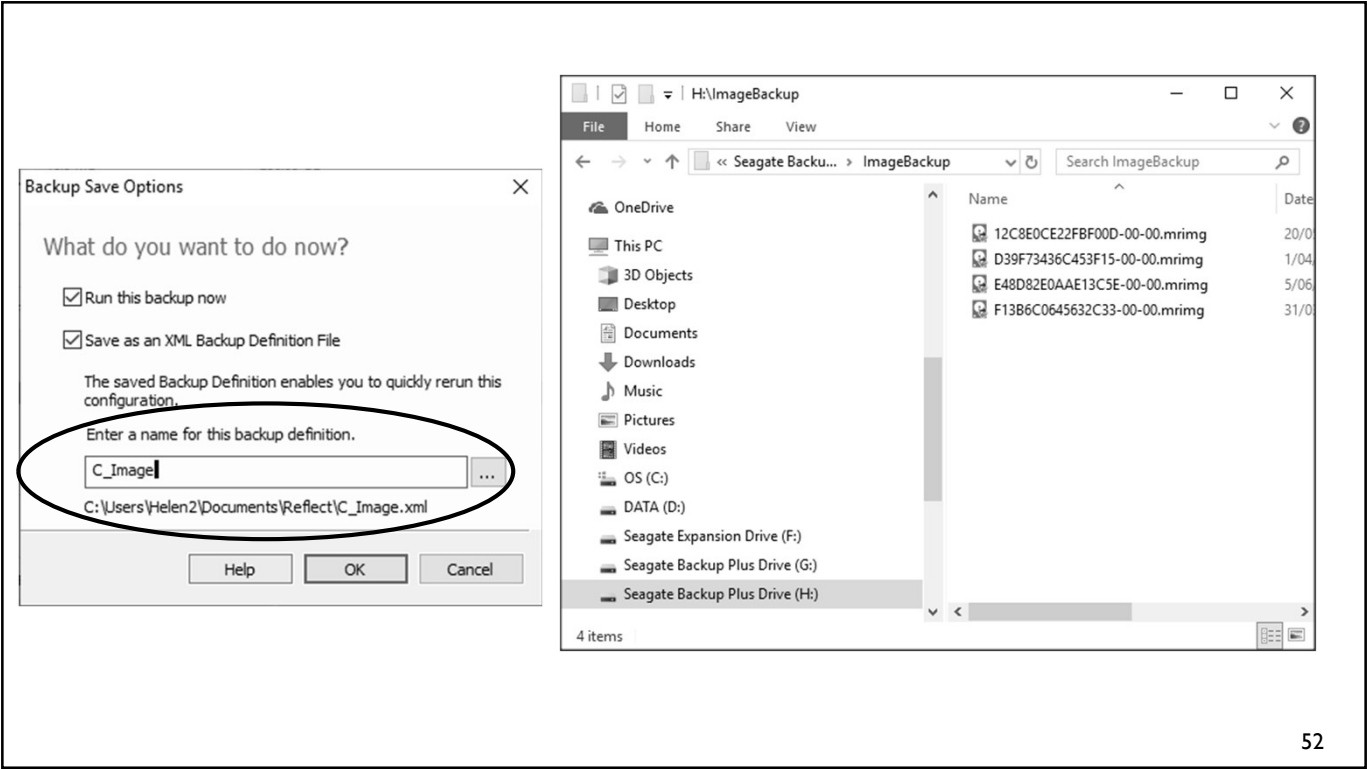
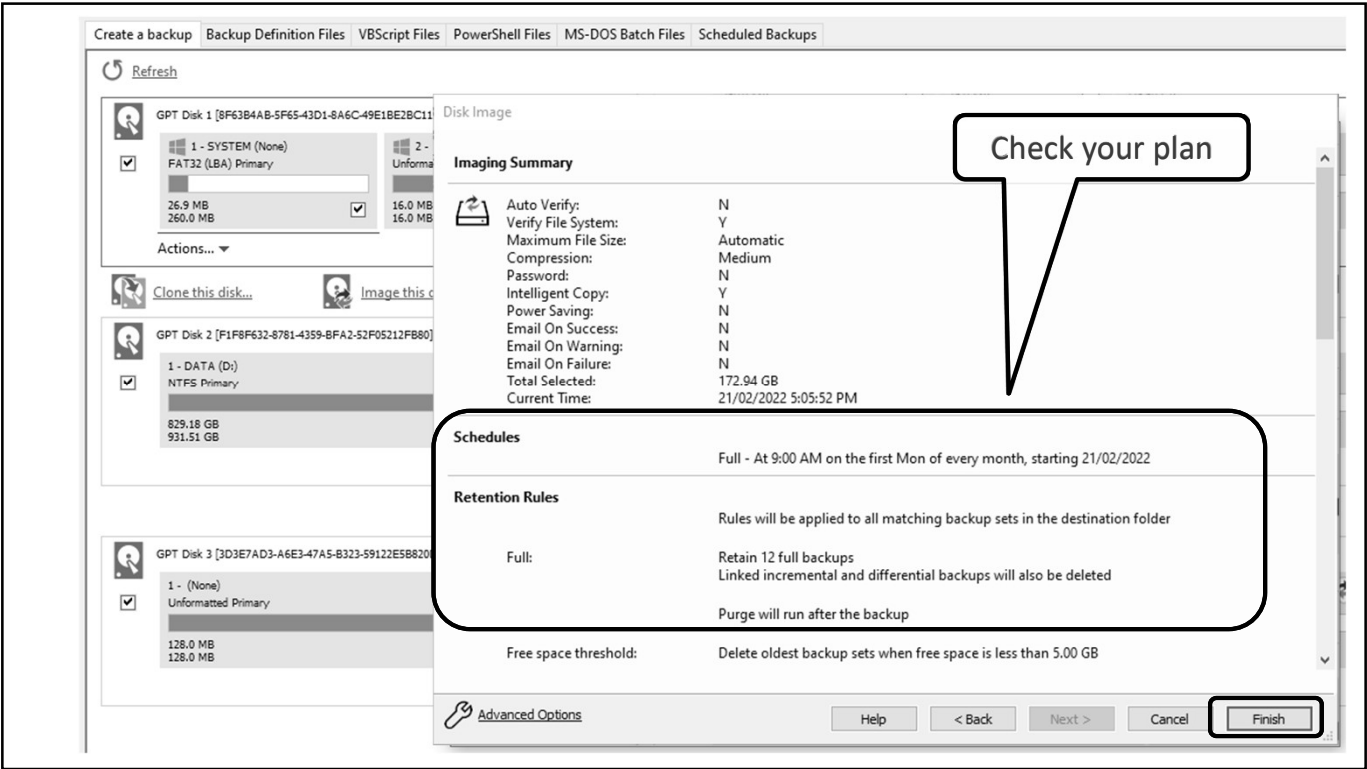
Disk Clone - creates an exact copy (bit to bit) of partitions to a different drive.
For example, upgrading to a larger hard drive or moving from a large magnetic hard disk to a smaller and faster SSD. When you clone a hard drive, you can boot from the target disk on the same system after cloning.

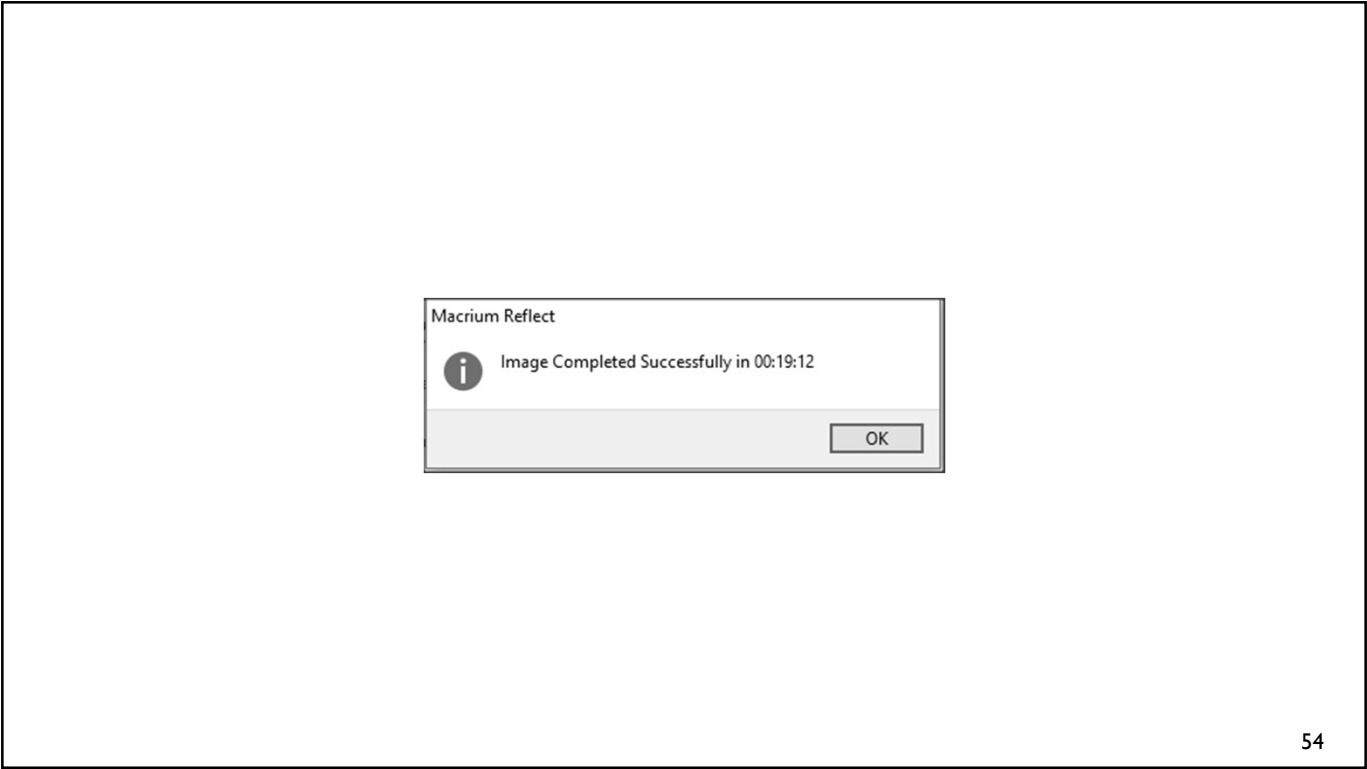
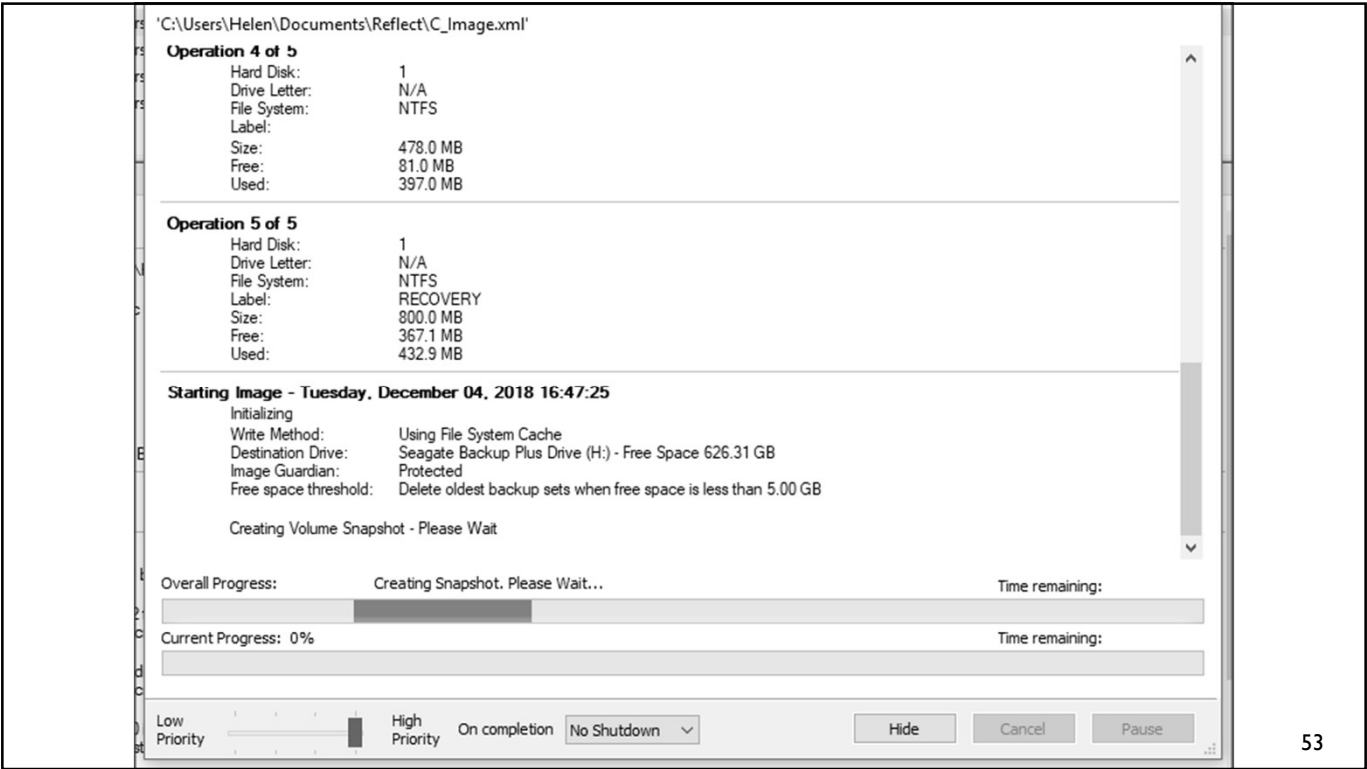
File Backup –not available in free version









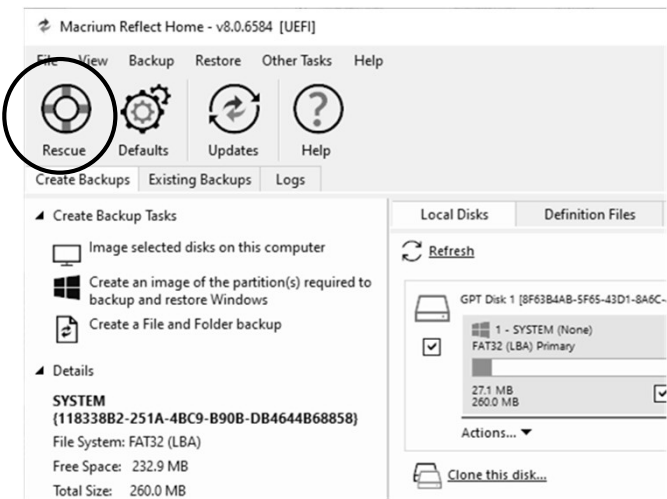


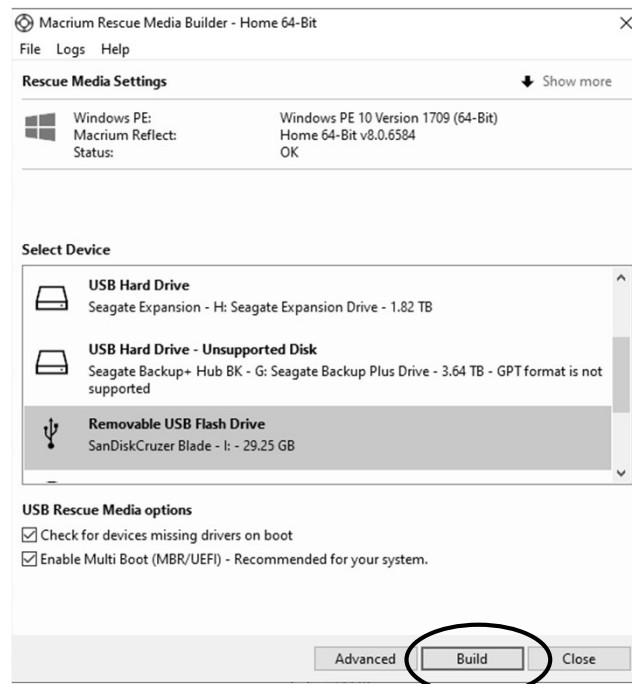
5. Create Rescue Media

Rescue Media - CD, DVD, or USB stick that you would boot from in order to restore from your image.

Note: The Image backup isn't a direct copy of your C: drive. It's just a copy of the contents, but not setup to boot from.

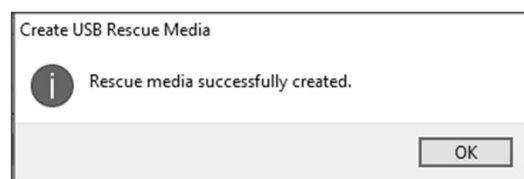
Format your USB drive then build a rescue disc





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Label and save your rescue media



- You don't need to create a new rescue drive each time you backup. But do it:
 1. When you first set up backups
 2. After a major update is also a good idea.

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6. Check your backups worked

Backups generally work.

BUT If your backups don't work, you don't have a backup!

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How to test your backups

1. Check some files in the backup
2. Restore some files
3. Boot from 'rescue media'
4. Perform an image restore – BUT STOP AT THE LAST STEP

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1. Check some files in the backup

- a) 'Mount' the image backup as a new drive
(ie 'pretend' that the backup is a hard disk)
- b) Explore the 'drive'
- c) Open a few files and check they look OK
- d) 'Unmount' or 'Detach' the drive when you are finished.

See <https://www.howtogeek.com/226436/how-to-mount-a-macrium-reflect-backup-image-to-retrieve-files/> for a tutorial

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2. Restore some files

- a) Pick an important file on your hard disk.
- b) Rename it.
- c) Now restore the original from your backup, and make sure it's the same.
- d) Repeat this for several files in different locations to ensure the files you expect to be backed up actually have been, and can be recovered.

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3. Boot from 'rescue media'

- a) Create an 'emergency disk' or 'rescue media'
- b) boot from the 'emergency disk' or 'rescue media' to make sure it works.
- c) Once loaded, make sure it can 'see':
 - the backup you've created,
 - the hard disk onto which the backup might be restored.

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4. Perform an image restore – BUT STOP AT THE LAST STEP

- a) Follow the sequence to perform an image restore BUT ...
 - b) Stop at the very last step. Do not actually perform the restore.
- (This assumes your backup strategy involves image backups.)

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Why not restore the image?

- It would be the only FULL test of the backup process BUT
- If it doesn't work – you've possibly destroyed what was on your hard disk
- If we HAVE to use the backup 'for real' we accept that risk
- If we're just testing, that risk may be too great.

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When to test your backups

- Immediately after you set up your backup strategy, ie after your first backup
- Regularly after – say every six months
- Keep an eye open to check that backups are happening – frequently check your drive to ensure the backup files are there

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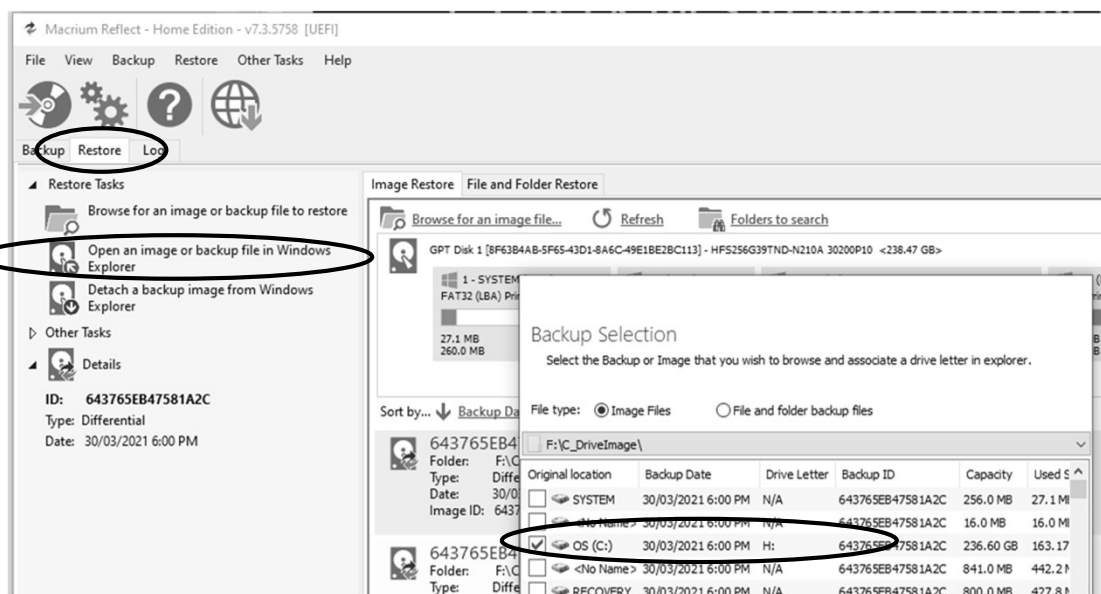
What if your backup test fails?

- STOP
- Fix the problem – depends on what it is
- Do it now – don't put it off, because you don't have a backup!

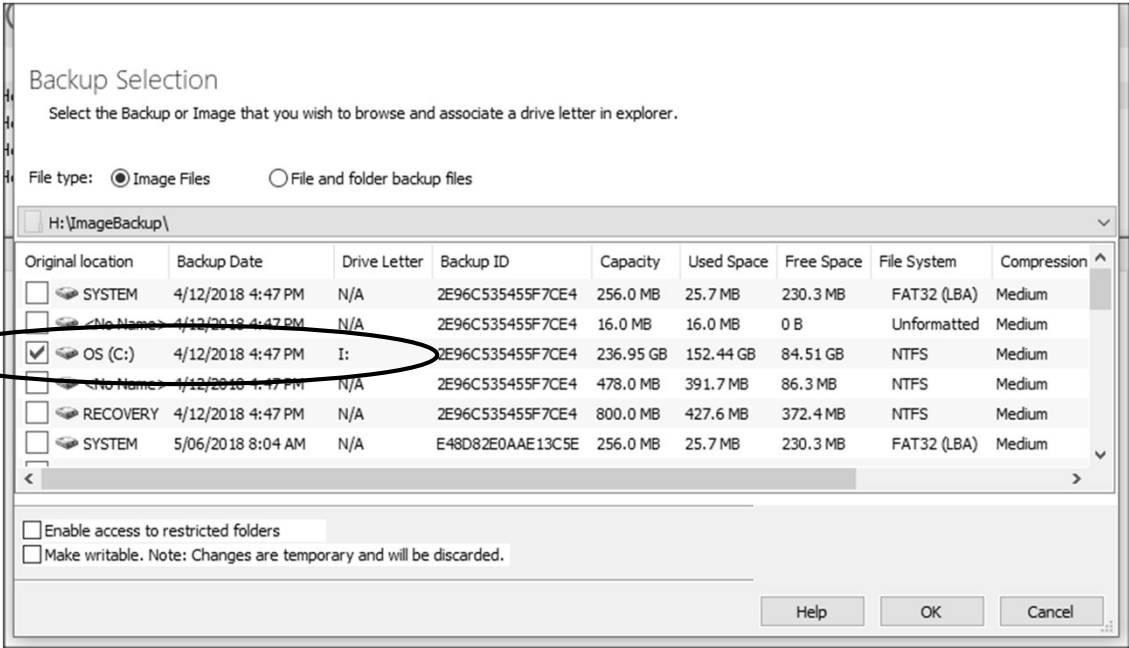
Don't panic!
Backups generally work

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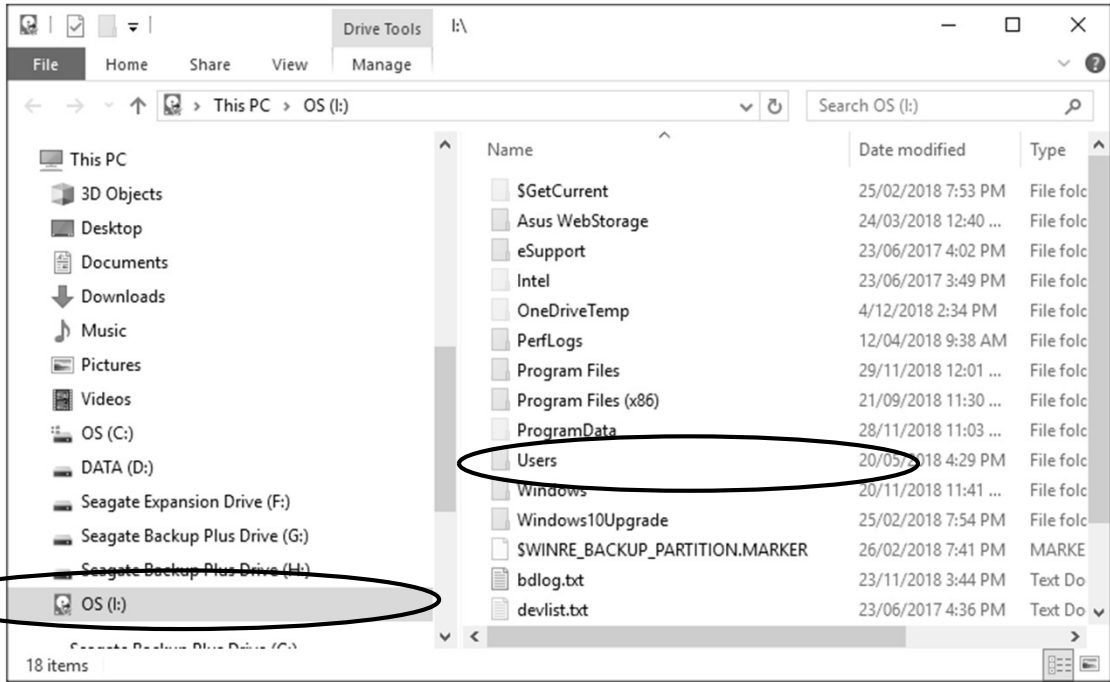
1. Check files in Macrium Reflect



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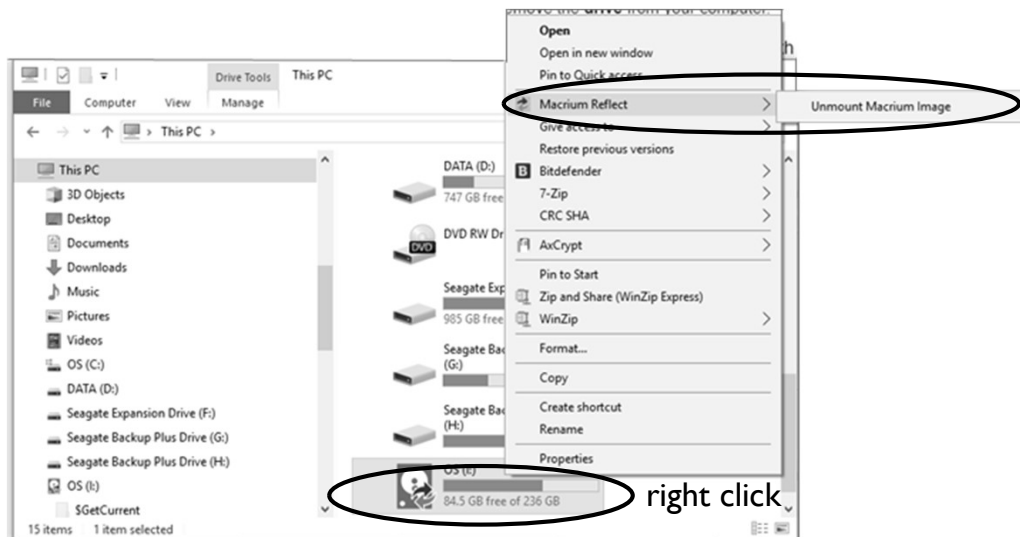


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‘Unmount’ the drive when you’re finished



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7. What to do next

1. *Get TWO (or more) external hard drives – each 3 x capacity of the drive(s) you want to backup*
2. *Choose your BACKUP SOFTWARE (Windows or Macrium Reflect)*
3. *Set up REGULAR IMAGE BACKUPS of your C: drive and SAVE OFFLINE*
4. *Consider setting up regular backups of other storage drives*
5. *Make sure you have a RESCUE DISK*
6. *CHECK your backups regularly*

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My Backup Plan

- Now I know what to do, I can
 - set up a backup plan and
 - KEEP to it!

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ANY QUESTIONS ?

*Thank you for attending this
U3A presentation / demonstration*

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