

Backups, Syncs and Cloud storage

Why are they essential?

- Because bad things happen when you least want them to;
 - Human error, usually yourself
 - Hardware failure – usually disk drives
 - Malicious intrusion

What is a backup?

- A copy of files or folders to somewhere other than the computer device, or Cloud where they are normally used. These can then be restored in the event of a failure of the original material.
- Locations for backups
 - Removable media (DVD,CDROM)
 - External Storage – USB Flash disks and drives
 - The Cloud

Backup Vs Sync

- A backup can be removed and cannot be changed again until it is re-connected e.g. via a USB memory stick.
- A sync will replicate changes in real time, mistakes will also be replicated e.g Microsoft One Drive or Apple Photos

Decide on a strategy

- What can you not afford to lose? E.g. Photos, Documents, Videos, Music
- How big is it?
 - This will dictate how big your backup destination(s) will need to be.
 - If it is small, you can probably just overwrite what is already in the backup, if it is large you may want to just save the files that have changed since your last backup.
- How volatile is it? - How often will you need to run the backup?
- Where do you want it to be saved? USB, Cloud?
- How will you test you can recover files from your backup?

What about Phones and Tablets?

Considerations for Phones and Tablets

- You may want to make a safe copy of valuable data such as:
 - Photos and videos
 - Contacts (phone numbers)
 - Messages
 - Apps and settings
- In case your device is lost, broken, or replaced

Where to backup a mobile phone.

You cannot plug a USB stick into a phone, so you have two options.

- Cloud backup (internet-based storage)
- Computer backup (using a cable)

To turn on iCloud backup on an Apple device

1. Open Settings
2. Tap your name at the top
3. Tap iCloud
4. Tap iCloud Backup
5. Turn it ON

The next time you are connected to Wi-Fi and charging, it will back up automatically.

Backing Up an Android Phone or Tablet

1. Open Settings
2. Tap Google
3. Tap Backup
4. Turn Backup ON

This will back your phone up to Google cloud.

Backing Up a phone or tablet to a Computer with a cable

- Why do this?
 - No internet needed
 - Extra copy for safety
- What you need:
 - Charge/sync cable
 - A computer (Windows or Mac)
- This is optional—but good as a second backup to protect in case you fully delete something.

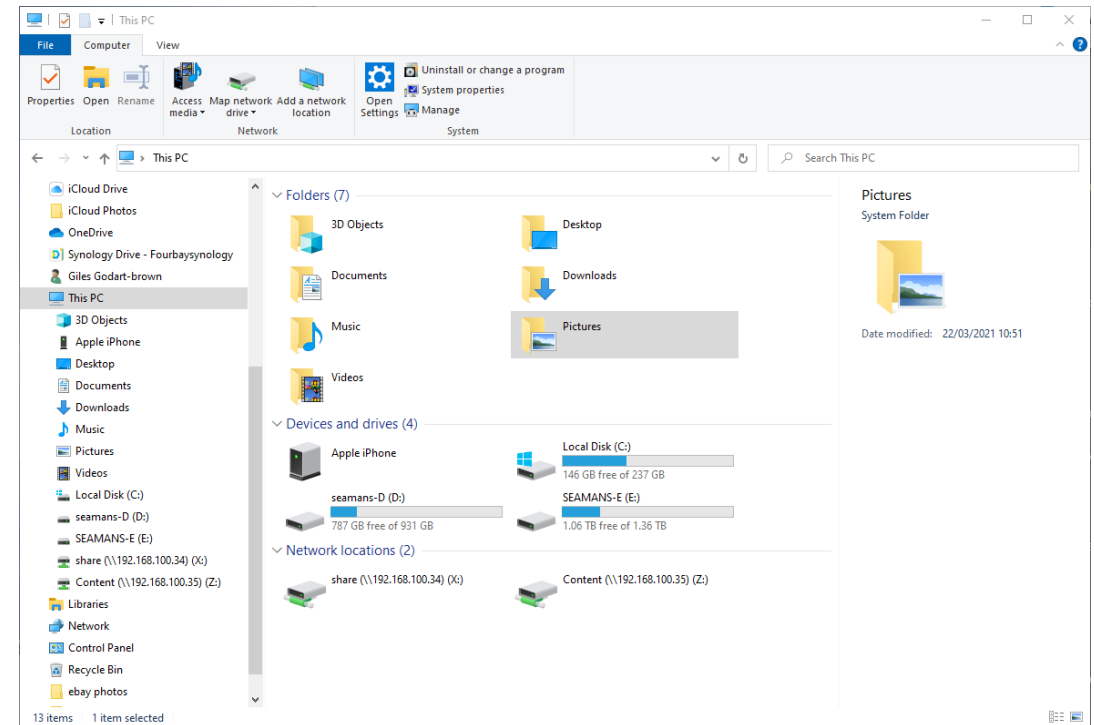
What to backup and how big is it?

What to back up on a computer

Windows and Mac both have default folders for Documents, Photos, Videos, Music etc.

If you always save files to these locations, then start with them.

If you have a lot on your Desktop don't forget to include it.






What not to Backup

- The Downloads folder - if you can simply download the files again if they get lost.
- Your Applications (the “Program Files” and “Program Files (x86)” folders) because;
 - You can always download and re-install them again if they get lost.
 - They nearly all rely on hidden files in other places on your PC so if you were to just restore the Program Files folders it is unlikely they will work.
- The Windows operating system (the Windows folder)
 - It is huge and largely static and it is hard to do without using special backup software
 - It has a license number tied to your PC so it won't work if you just restore it to a new machine
 - If your PC does die catastrophically, you are likely to either get it repaired, in which case the repairer will install windows for you or you get a new one with it already installed.
 - Some installations have a hidden ‘restore partition’ on the hard drive which can be used to restore the Windows operating system (run Disk Management if you want to see). But this is useless if the drive is dead.

How big will my backup be?

Bits and Bytes

- Computers hold characters as 8 binary digits (Bits) called a Byte e.g.
 - A = 10000001 
 - B = 10000010 
 - C = 10000011 
- File size is in multiples of Bytes
 - 1024 Bytes = 1 Kilobyte (K, KB or KBy)
 - 1024 Kilobytes = 1 Megabyte (M, MB or Mby)
 - 1024 Megabytes = 1 Gigabyte (G, GB or Gby)
 - 1024 Gigabytes = 1 Terabyte (T, TB or Tby)
- 1Gby is about 10 metres of books on a shelf or about 30 minutes of HD video



1Gby = 10m

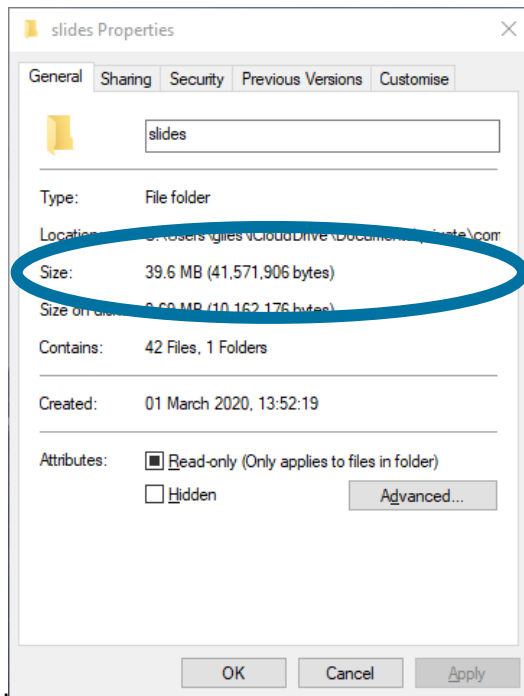


32Gby USB flash drive (£5)
320m of books or
16 hours of video

How big are my files or folders?

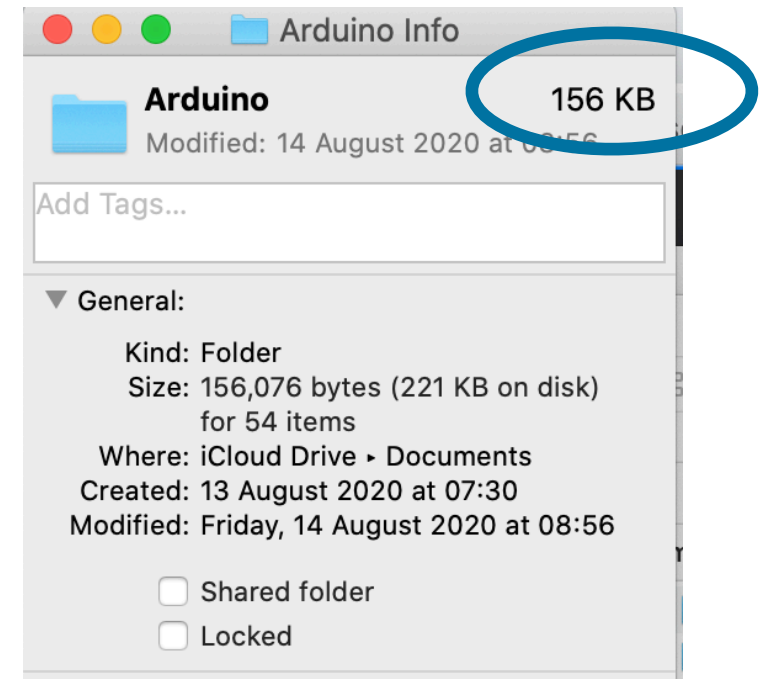
Windows

Select a folder or file in Explorer, right click on it and select 'Properties'



Mac

Select a folder or file in Finder, right click on it and select 'Get info'



Exercise

- How big is your documents folder?
 - Mine is 2.8 Gby, but I also have a 14Gby code folder

Simple backup strategy

Create a small table to calculate how much space you need e.g.

Folder	Size
Documents	19M
Pictures	61M
Videos	< 1M
Music	<1M
Desktop	22M
TOTAL	85M

- You could make 376 different copies of these folders (one for every day of the year) on a 32G USB stick,
- See https://godartbrowncom.ipage.com/MCC/docs/simple_backup_calculator.ods for a spreadsheet version of the table above

How often?

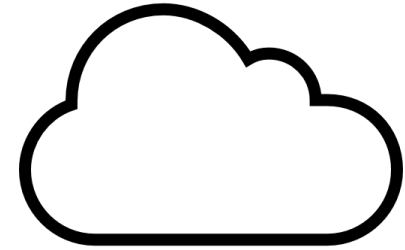
How often to back up

- This depends on how important the file is or how often it changes
 - Really valuable files (like Photos) may need to be backed up immediately
 - Static or old files don't need to be backed up often
 - Things that are easy to replace (like Downloads) don't need backing up at all
- It may depend on how long/hard it is to do the backup
 - Its often easier to just back everything up at the end of the day

Where to put the backup

External Local storage

The Cloud (e.g. Google drive)



USB Flash drive (£8 for 64Gb, £14 for 128Gby)



USB External disk (£43 for 1 Tby)



Cloud Storage examples

- iCloud Photos/Drive (5 Gby free)
- Google Drive (15 Gby free)
- Microsoft one drive (5 Gby free)
- BT cloud (10 Gby or more free depending on your broadband package)

Simple USB stick backup demo

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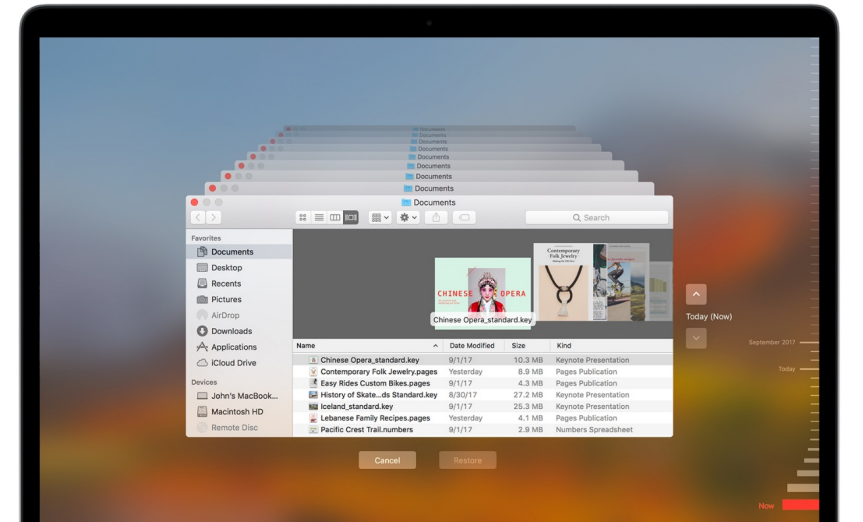
By Giles Godart-Brown

USB device Backups example

- Make restoring easier by having a folder structure e.g.
 - For multiple versions name the folder by date e.g.
 - F:/Backups/2021/Jan
 - F:/Backups/2021/Feb
 - Etc...
 - Have single folders for static information that you want to just overwrite e.g.
 - F:/Backups/My_old_documents
- Use backup software if your backups are large and volatile so that only changed files get backed up, more in this later.
- **Don't forget to 'safely eject' USB storage devices**

Backup for Mac users

- The best by far is Time Machine, its free and built into the Mac Operating system.
- All you need is a USB drive or a NAS



Windows Backup

- Windows has a built in utility that automatically syncs with their One drive cloud
 - Windows>Settings>Accounts>Manage Sync settings
- Any change or delete you do on the PC will be replicated in the Cloud backup
- Windows does not have a utility to backup incrementally to an external disk or other Cloud (e.g. Google Drive)
 - use File explorer and copy/paste or drag and drop.

Mail backup

Email backups

- Emails are held both on the server (Gmail, Hotmail etc.) AND on your hard drive in a hidden folder so long as you have the IMAP option set up and not POP.
- Normally you don't need to back them up as your email provider will be looking after them in their IMAP folders
- You may want to keep a local copy of emails, folders and attachments on your PC where you can easily find them and add them to your own backup strategy.

Saving individual emails locally

Very few mail clients have the option to export an entire folder to a local file, you can only do this one email at a time.

The exact mechanisms for doing the following will vary a little depending on your email provider and the app you are using

- Attachments can simply be downloaded and saved locally. This is good practice anyway as you may then be able to delete the email and reduce how much of your email quota is in use.
- Use 'print' to save a copy of the text of an email as a pdf.
- Use save (...Actions->Save_as in the Windows mail client) to save an email with its attachment in a format (.eml) that can only be opened using a mail client.

Email backup demo

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By Giles Godart-Brown

Extra slides

Other storage locations; NAS and Cloud Storage

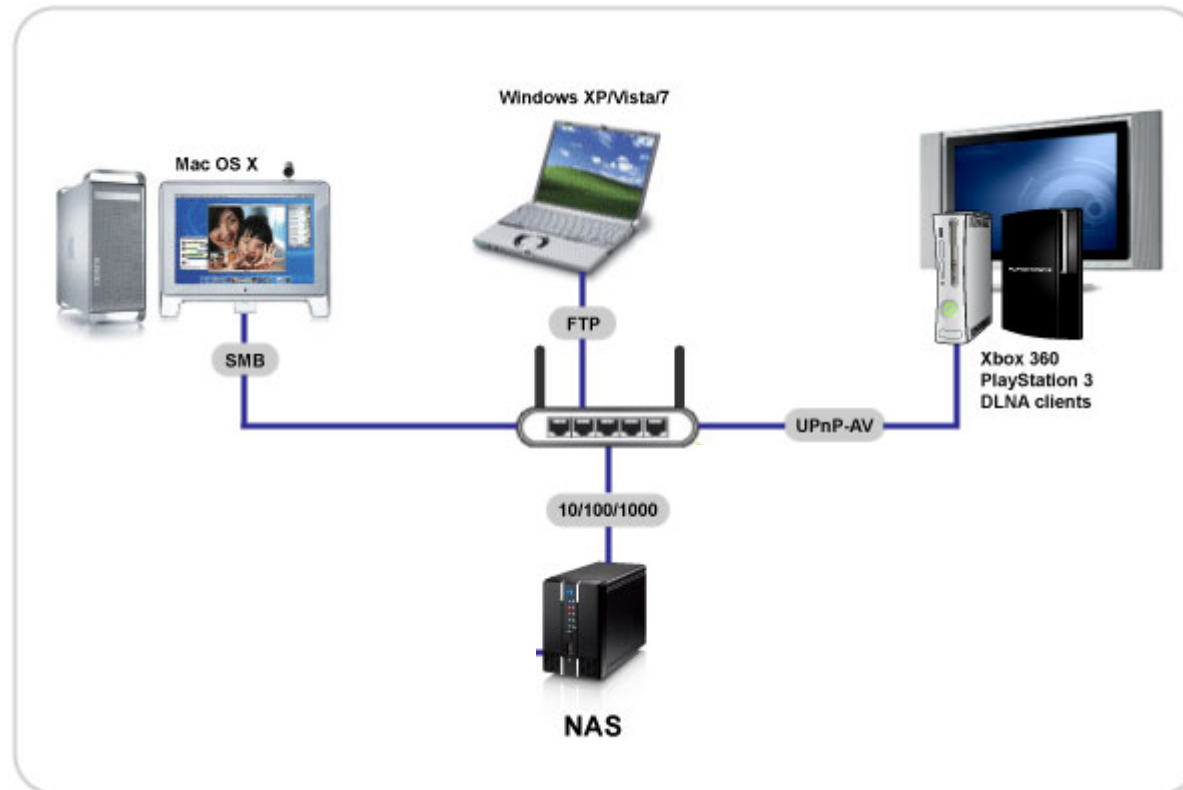
USB drive

Physically connected to your computer and not shared.



Network Attached Storage

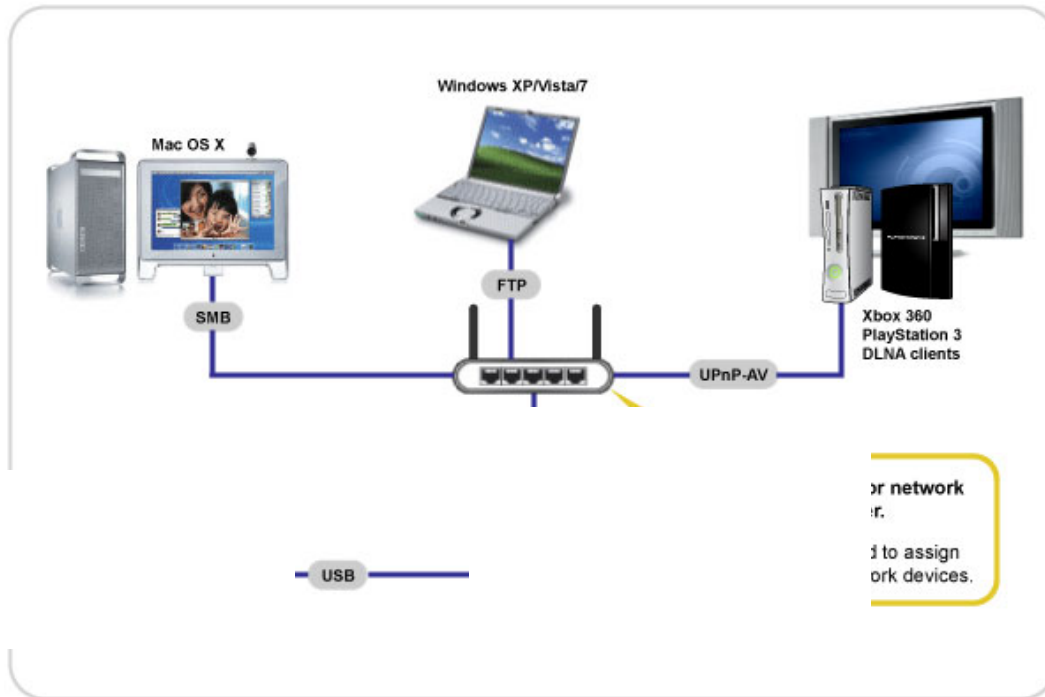
A NAS is one or more disks attached to your router



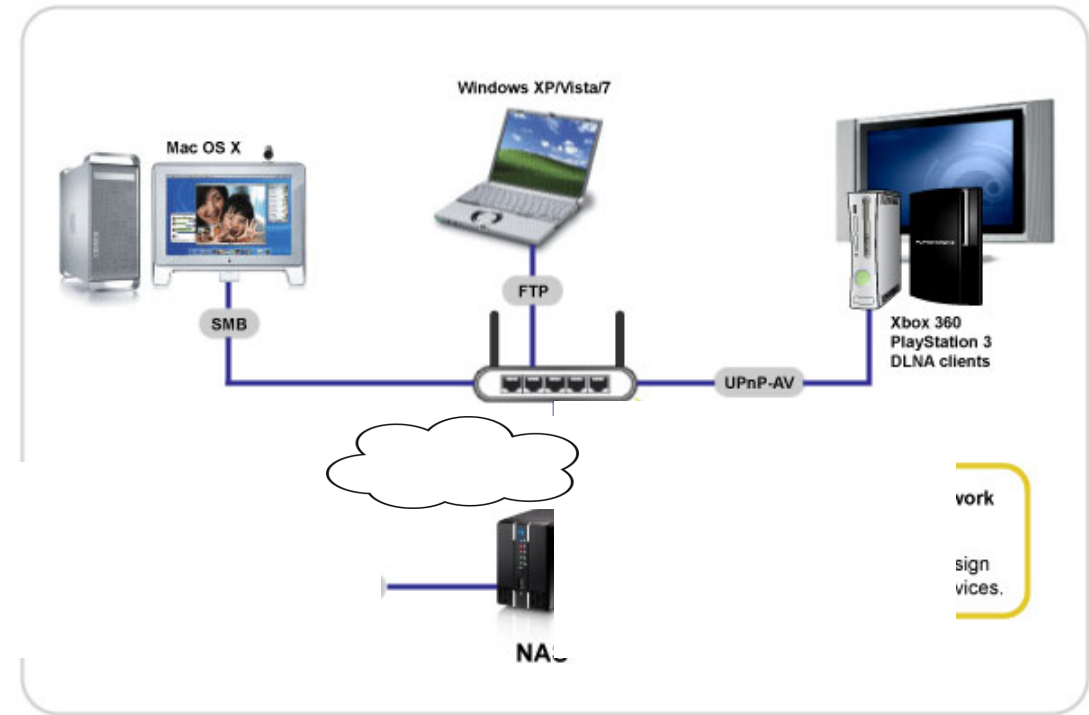
Shared folder Demo

Cloud Storage Vs NAS

NAS



Cloud



Why would you want to do this?

- Flexibility. Centralised storage, you can access all of your files from different devices
- Capacity. You can store a lot more on a NAS than your PC, but still access it from your PC and other devices as if it was on their local disk drives.
- Connectivity. Your PC can connect to it by WiFi – no need for physical connection like USB.
- Reliability. They are highly reliable and fast because they use Redundant Arrays of Inexpensive Disks (RAID), typically 2 or 4 disks and can survive a disk failure.
 - RAID-0 Mirroring - Half total capacity (i.e. two 1TBy disks hold 1TBy of data)
 - RAID-5 Uses Maths routines to increase capacity to about 75% (i.e. four 1.5 TBy disks hold 5 TBy of data)
- Services. They support many other services like Web Server, Email Server, Sync'd folders
- Why buy a NAS if its like the Cloud?
 - Speed. NAS is much quicker than Cloud storage, because it is not limited by your broadband connection.
 - Confidentiality. NAS is in your home network whereas Cloud storage means sending your data to Google/BT/Amazon

NAS Demo

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Remote drive Vs Synchronised Folder

- A shared drive is disk that appears as if it is connected to your computer directly but it isn't.
- A Synchronised Folder copies any file you change in that folder to the backup location after you save it
 - e.g. Microsoft One Drive, and Apple iCloud drive
 - The file can be accessed even when your computer is not online.

Cloud Storage demos

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Backup software demos

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Backup Software

- Easus
- Paragon Backup & Recovery