Win11 to Linux Backup
(ssh … no WSL’ing !!!)

-JMB

Project Features & Objectives:

- A recent experiment (within a LAN)…
- Access a Win11 PC's 'Shared Folder' via a separate Linux (Ubuntu) PC:
  - To backup data in the 'Shared Folder' to either a folder of the Ubuntu PC
  - or a mounted SSD (LUKS encrypted) of the Ubuntu PC.
- Use free and open source software (FOSS).
- Not reliant on any cloud based storage.

Project Features & Objectives:

- Allow one from the Linux / Ubuntu PC to:
  - Copy files from a Win11 PC to a Linux (Ubuntu) PC.
  - Easily view, folders that are on the Win11 PC.
  - Add, change delete files & folders in the Win11 PC, if configured appropriately.
  - Use the Win11PC’s shared folder like a native folder (using caja, nautilus, etc.)
  - Use utilities like: rsync, df, k4dirstat, gedit, meld, etc. on the Win11-PC files !!!

Need, Limitations:

Need?

- Enable family (Win11 users) to backup data to a Linux device they physically possess. Reduce / eliminate reliance on M$oft's 'OneDrive'

History, Experience & Track Record:

- Have used LUKS on Linux computers for more than a decade.
- Proven itself as reliable,day in and day out, with multiple devices.

Limitations:

- The backup is only as good as the Linux / Ubuntu PC!
- If the Linux / Ubuntu PC or its password is lost, so is the data.
- If the Linux / Ubuntu PC's storage / SSD is corrupted by premature disconnection, the data could be lost.
- If the Linux / Ubuntu PC fails, the data could be unrecoverable.

Other Options:

Other Options:

- Win10+ offers BitBucket which is:
  - Perhaps incompatible with Linux.
  - Watered-down in the ‘Home’ version.
  - Linked to Micro$oft account where the key is stored.
- 3rd party free / $oftware ‘VeraCrypt’, ‘TrueCrypt’, ‘DiskCryptor’, AxCrypt, etc.
  - Compatibility with Linux is non-existent or questionable
- Built-in encryption in the SSD-HD
  - Linux compatibility unknown.
  - Not willing to spend money to experiment or risk one’s data.

Hardware:

- A computer running Linux (Debian) distribution

  Optionally a SATA SSD and a USB 3.0+ HD enclosure

  or

  USB 3.0+ SSD

  (attached as a USB-SSD as ext4 & LUKS encryption)

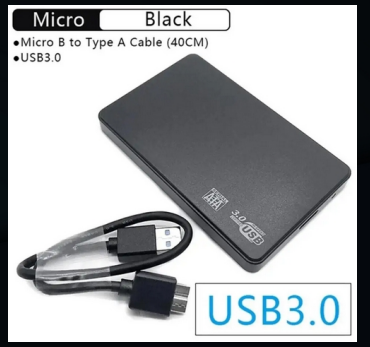
- A computer running Win 10/11+ with OpenSSH server installed

  The computer that has the data to be backed up

USB + SATA SSD *:

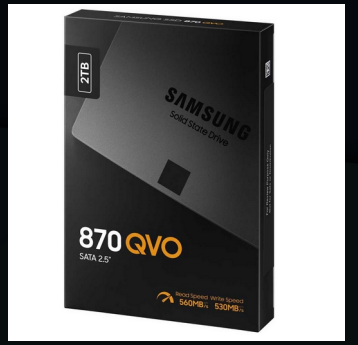
USB 3.0 Enclosure

- 2.5” 5Gbps HD Case for SATA Drive
- Approx. $4 (incl. S&H - AliExpress)



SATA SSD

- Samsung SSD 870 QVO 2TB
- Samsung online store



* Why not a pre-built USB-SSD?

Connect the SSD inside a desktop PC via SATA cable if needed

Overview: Sections A & B

A: Install, configure the Win11 computer.

- Share a folder. (verify using: cmd -> ‘net share’)
- Install OpenSSH server (client is optional).
- Configure firewall rules.

B: Install, configure the Linux (Ubuntu) computer.

- Install necessary packages.
- Create a mount point; mount cifs ...
- Optionally format a USB-SSD (est4 / LUKS).

The IBM article listed in the last slide “Reference (LUKS)”, is well written & shows the command line way to accomplish this.

Section A: (Win11 PC)

Win11 (Install OpenSSH)

- In PowerShell as ‘Administrator:

```
Add-WindowsCapability -Online -Name OpenSSH.Client~~~~0.0.1.0

Add-WindowsCapability -Online -Name OpenSSH.Server~~~~0.0.1.0

Start-Service sshd

Set-Service -Name sshd -StartupType Automatic
```

Win11 (Configure firewall)

- In PowerShell as ‘Administrator:

```
Set-NetFirewallAddressFilter -AssociatedNetFirewallRule 'OpenSSH-Server-In-TCP' -RemoteAddress 192.168.1.0/24


Get-NetFirewallRule -Name "OpenSSH-Server-In-TCP" | Get-NetFirewallAddressFilter | Format-List LocalAddress, RemoteAddress

    LocalAddress     : 192.168.1.0/255.255.255.0
    RemoteAddress: 192.168.1.0/255.255.255.0
```

- The Set-NetFirewallAddressFilter … did not work on a different Win11 PC, nor was it needed. Just a reboot seemed to do the trick.

Win11 (Turn off “Use Sharing Wizard”)

- Explorer → Folder Options → View
- Turn off “Use Sharing Wizard”

Rick Strahl's Weblog:

https://weblog.west-wind.com/posts/2024/Jan/10/Sharing-Tab-Missing-in-Windows-11-Folder-Properties

FileBrowser:

https://www.stratospherix.com/support/access-files-on-windows11-from-your-ipad.php

Win11 (Allow Folder Sharing)

- Turn on network discovery and file sharing:

  Settings → Network & Internet → Advanced network settings → Advanced sharing settings.
- Under your active profile (Private/Domain), turn on Network discovery and File and printer sharing.
- Make sure your Windows PC and Linux PC are on the same LAN and can ping each other by IP.

- Create and share the folder on Windows
- Choose or create a folder, e.g. C:\Users\<user>\MyFiles.
- Right-click folder (MyFiles) → Properties → Sharing tab → Advanced Sharing….
- Tick ‘Share this folder’ and name it, e.g. 'WinShare'.
- Click Permissions & remove “Everyone” if you want to lock it down.
- Add the Windows <user>, with Read or Change (for write) as needed.
- On the Security tab, ensure that same user (or a group it’s in) has NTFS permissions that match what you expect (Read or Modify).
- Your UNC path will look like: \\<PC-NAME>\share or using IP: \\192.168.1.XXX\WinShare.

Win11 (Allow Folder Sharing)

- If the “Sharing” tab is unavailable … **Blame** Micro$oft for making it hard for users!!!
- Settings → ‘cmd’ choose ‘Run as Administrator’

  Type:

  net share WinShare="C:\Users\<user>\MyFiles" /grant:<PCNAME>\<user>,READ

  Options: “READ / CHANGE / FULL”

  (Remember this is share permission; the NTFS (Security tab) permissions on the folder still also apply.)

- Why create the “MyFiles“ folder?
  - Because folders: Documents, Downloads, Pictures, Music, Videos, etc. in the user’s folder automatically get synced to M$oft’s ‘OneDrive’ !!!
  - Create such sub-folders in the “MyFiles“ folder and you shield yourself from their clutches...

Win11 (Folder Sharing -options)

- READ
  - Users can list the files and sub-folders.
  - They can open and read files, and run programs.
  - They cannot create, modify, or delete files or folders.
- CHANGE
  - Includes everything in READ.
  - Additionally allows creating new files and folders, modifying existing files, and deleting files & folders.
  - Does not let the user change share permissions themselves.
- FULL
  - Includes everything in CHANGE.
  - Also allows changing permissions on the share (and effectively gives full administrative control over that share to that user/group).

Section B: (Linux / Ubuntu PC)

Install necessary apt package:

- In the Linux (Ubuntu) PC (not the Win11 PC):
  - *sudo aptitude install cifs-utils*

    For mounting the WinPC's SMB shared folder ...

Mount the Win Shared Folder:

- In the Linux (Ubuntu) PC (not the Win11 PC):
  - *sudo mkdir -p /mnt/WinShare*
  - *sudo chown <linux-user>:<linux-user> /mnt/WinShare*
  - *sudo mount -t cifs //192.168.1.xxx/MyFiles /mnt/WinShare -o username=<user>,vers=3.0*

    You will be prompted for the sudo password of the Linux-PC's <linux-user>

    Next you will be prompted for the password of the Win-PC's <user>

    Since the Win-PC's password is transmitted as clear text, do NOT try this outside of your LAN !!!

Test the /mnt/WinShare Folder:

- Check if it is mounted:
  - *df -h*

Filesystem	Size	Used	Avail	Use%	Mounted on
//192.168.1.XXX/WinShare	1.9T	244G	1.7T	13%	/mnt/WinShare

- Try commands like:
  - *k4dirstat /mnt/WinShare &*
  - *du -hs /mnt/WinShare*
  - *… etc.*

rsync: Shared Folder → Local Folder

- In the Linux (Ubuntu) PC (not the Win11 PC):
  - *rsync -av --progress --dry-run /mnt/WinShare /tmp*
  - *rsync -av --progress /mnt/WinShare /home/<linux-user>/MyFiles*
- Install & try out a GUI version of rsync (nice!):
  - *sudo aptitude install grsync*
  - *grsync &*
- When done, unmount the ‘Shared Folder’:
  - *sudo umount /mnt/WinShare*

If the Win11-PC is hibernating or powered off; the mount will be in a hung state.

Then commands like ‘df’, ‘caja’, ‘nautilus’ may not work correctly or not at all.

Done…

next GUI window dressing !!!

~/Desktop/Mount-WinShare.desktop

```
[Desktop Entry]

Version=1.0

Type=Application

Name=Mount Windows Share

Comment=Mount the CIFS share //C/Share to /mnt/WinShare

Icon=/home/<user>/Icons/Folder-Share.png          # Use any image of your choice

Exec=gnome-terminal -- bash -c "sudo mount -t cifs //192.168.1.xxx/MyFiles /mnt/WinShare -o username=<user>,vers=3.0; exec bash"

Terminal=false

Categories=Utility;
```

Additional: (RSync to a LUKS SSD)

Format an SSD as LUKS & ext4:

- In the Linux (Ubuntu) PC (not the Win11 PC):
  - *sudo aptitude install crypt-setup gnome-disk-utility*

    If not already installed by default …
  - *sudo aptitude install cifs-utils*

    For mounting the WinPC's SMB shared folder ...
- Prepare the USB-SSD:

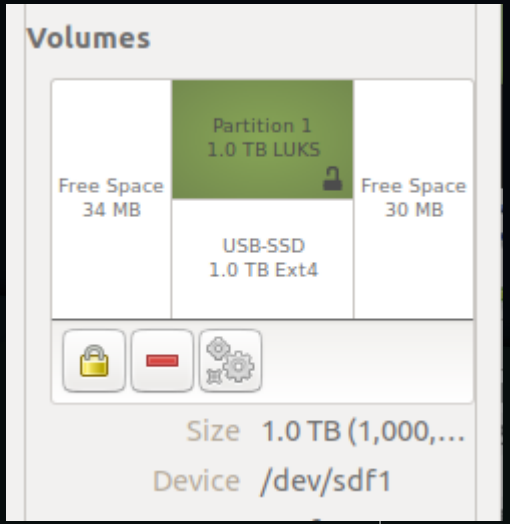
  MATE desktop: Menu → All → Disks → Encrypted (LUKS) → Format (ext4; Partitioned: "USB-SSD") → etc.

  *** Generally there will be more than one drive listed.

  Be VERY careful and select the correct USB connected drive !!! ***
- Create a file at the top level of the USB-SSD within its encrypted partition when it is in an unlocked state:

  touch /mnt/USB-SSD/If_you_can_see_this_it_is_unlocked

  (it will be useful later, as you will see …)



rsync: Shared Folder → Local Folder

- In the Linux (Ubuntu) PC (not the Win PC):

  rsync -av --progress --dry-run /mnt/WinShare /mnt/USB-SSD

  *rsync -av --progress /mnt/WinShare *
  /mnt/USB-SSD/home/<linux-user>/MyFiles

References (LUKS):

- https://www.ibm.com/docs/en/order-management-sw/10.0?topic=considerations-encrypting-data-partitions-using-luks
- https://blog.elcomsoft.com/2020/08/breaking-luks-encryption/
- https://security.stackexchange.com/questions/251176/is-luks-still-an-effective-option-for-consumer-fde-considering-elcomsoft-can-bre
- https://askubuntu.com/questions/95137/how-to-change-luks-passphrase

Questions,comments or rewards:

? ! $

- **Q: Why install ‘ssh’ if it is not being used?**
- **A: Good question !**

  So it can be used for a secure tunnel via which the ‘mount’ command can connect to the Win11-PC’s SMB (Samba) server. This was not utilized in the LAN based setup of this presentation.