User Manual for Data Backups

Accepted formats are: EXT3, EXT4, NTFS, XFS, FAT32, exFAT and HFS+ (Mac OS).
Recommended format: EXT3 and EXT4

Keep in mind that the HFS+ format has limited support on Linux; the drivers change frequently and even the latest drivers may fail. Therefore, if possible, AVOID backing up on Mac OS formatted disks. If the HFS+ is still used, journaling on the disk may need to be disabled first, especially if you plan to Connect the drive to a workstation other than 4 or 7. Details on journal disabling can be found here:
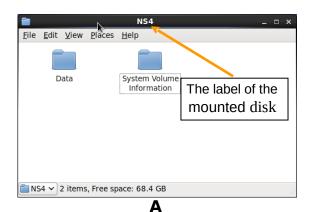https://www.gmca.aps.anl.gov/userprogram/hfsplus.html

USB3 drives are the only supported choice because they are faster than USB2, eSATA or Firewire. A USB3 connector can be recognized by its blue-colored socket or by its logo:

DO NOT USE ANY SPACES OR SPECIAL CHARACTERS IN THE FILE OR DIRECTORY NAMES!

Mounting backup disks and preparing for backups

1. Log in with your account on the Linux workstation.
2. If needed, plug the backup disk in the nearby outlet or the power strip (provided by the GM/CA staff).
3. Connect the disk to the same computer with USB3 data cable.
4. Power up the disk if needed - some disks have power switch and some don't.

A window should pop up with the disk name (Fig. 1A). Full path to the backup disk is /run/media/username/DiskLabel, or /run/media/user0/NS4 for the disk on Fig. 1.
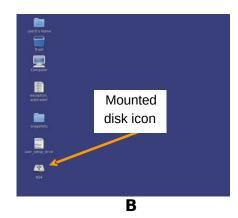At the same time, an icon with the same name will appear on the desktop (Fig 1B).

Figure 1: A) a window and B) an icon appearing when external hard disk is mounted on the computer

Backing up the data

Preferred option is to run the script named ***backup_rsync.sh*** provided by GM/CA staff.
Once started, the script will check for new files every 5 minutes and will add them to the backup.
You can also run rsync, scp, cp (with –p option recommended), midnight commander (mc), Engrampa Archive Manager (via the Applications → Accessories menu), double commander, or drag and drop utility.

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To back up contents of the CURRENT directory, run

   backup_rsync.sh* /run/*media/username/DiskLabel

CTRL+C to stop the script. Depending on the state of the script, you may need to *CTRL+C* twice.

 Note: Running multiple copies of rsync may degrade performance. Therefore it is recommended to establish a directory tree for your data collection under one directory and than back up that directory with single rsync process. For example, establish Beamline_Today's Date under your home directory. At present, JBluIce creates such a directory by default.

If backup failed to write files onto the mounted disk, stop the script with CTRL+C, change the file and directory ownership to your own account, change the file and directory access, and run backup again:

   1   ***sudo chown_media.pl −R /run/media/username/DiskLabel***
   2   ***sudo chmod_media.pl −R /run/media/username/DiskLabel***
   3   ***backup_rsync.sh /run /media/username/DiskLabel***

Here and throughout the manual, if the DiskLabel contains spaces or special characters, prepend each of them individually with "\"..
Alternatively, after ***/run/media/username*** enter first few Linux-accepted characters of the disk label and then press the Tab key – the system should complete the disk name properly.

Deleting data from backup disks

1. On the disk window opened on the desktop, select a file, or a folder to be deleted and press "Delete", or right click on the files or folders and select "Move to Trash"
2. Right click on the "Trash" icon on the desktop and choose "Empty Trash"

REMEMBER: your files are not deleted until you empty trash!

Unmounting backup disks

To unplug or power down the disk, it MUST be unmounted first. Make sure there are no programs accessing any files and/or directories on the backup disk. There are two ways to unmount:

1. Right-click on the disk icon on the desktop (Fig. 1A) and select "Safely remove drive".
2. Execute command ***sudo umount /run/media/username/DiskLabel*** (no trailing slash).

First option works more reliably.

To check the mounted drives, type "df" or "df | grep media")

In rare cases, a drive's directory may remain after unmounting. To remove it, use

   sudo rmdir_media /run/media/username/DiskLabel

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Troubleshooting

If a disk was unplugged without first safely unmounting it (at the beamline or at users' own computers), it may not mount and may not show any error messages.
The safest solution for that situation is to plug the disk in Windows or Mac computer, depending on the disk format. It should clear the condition, after which the disk should be unmounted safely then unplugged. If Windows or Mac computers are not available (they are not available at the beamline) then executing **chkntfs** or **chkhfs** commands can check for this condition and fix it.

If your disk still didn't mount, there may be several different problems.

1. Type **mount** on the command prompt and press "Enter". Last line of resulting output will contain the format of the disk. If it is HFS+ you may be trying to mount the MacOS-formatted disk on a wrong workstation. Try mounting it on workstations 4 or 7.
2. If no window popped up or an icon appeared when you plugged your disk in, and if your disk is not MacOS-formatted, go to Applications → Accessories → Disks; find your disk in the list and click on it. Detailed information about your disk will be displayed on the right side of the window (Fig. 2). Attempt to mount the disk from there by clicking the play button (triangle pointing to the right).
3. If you decide to reformat the disk, keep in mind that FAT32 can only be used for disks of the size 2TB or less. Using EXT3/EXT4 will be most reliable and using exFAT most versatile. To format drive as exFAT from the Disks Utitility, choose Other format type and then exFAT on the next screen.
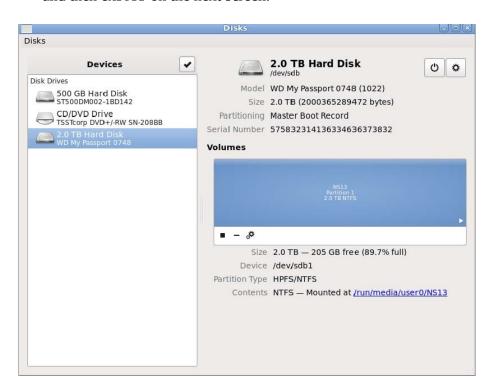

Figure 2: Disk Utility, launched from Applications → accessories → Disks

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If your disk didn't unmount and error shown on Figure 3 pops up, make sure no programs are accessing any files or folders on the disk. If the disk still cannot be unmounted, you can go to Applications → Accessories → Disks (Fig. 2) and unmount the disk from there. If not successful, execute the command

sudo umount/run /media/username/DiskLabel

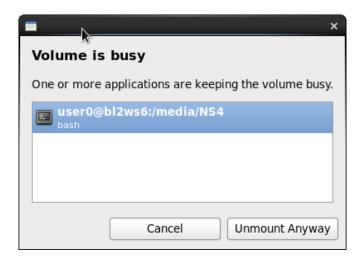If the disk still cannot be unmounted, log out the account and then unplug the disk.

Figure 3: Error during unmounting the backup disk.

Additional information and network backups

Please refer to these pages:
https://www.gmca.aps.anl.gov/userprogram/datamanagement.html
https://www.gmca.aps.anl.gov/remote/globusonline.html

Feedback

Please list here all problems encountered during disk mounting/unmounting and/or backups. Record the disk maker, model, and the format, if possible. You may use the back of this page as well.

Alert your host about the problems and about this entry in the manual.

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