# ANNEX A · PRACTICAL 4.6 — BACK UP, BREAK, RESTORE

**NAME** _____ **DATE** _____

**Tramuntana Apps** keeps its shared folder, `~/tramuntana-share`, in one place only. Today you give it a second copy on another disk — and you prove that you can get the data back. You work in `deb-lab`. Your empty 1 GB disk is `vdc` in this sheet: if yours has another name, use yours.

**TASKS 1–3 · 25 MIN**

## TASK 1 The backup disk

Everything here is from last week: partition, file system, mount point, mount.

```
lsblk
sudo parted -s /dev/vdc mklabel gpt \
  mkpart backup ext4 1MiB 100%
sudo mkfs.ext4 -L backup /dev/vdc1
sudo mkdir /mnt/backup
sudo mount /dev/vdc1 /mnt/backup
sudo chown $USER: /mnt/backup
df -h /mnt/backup
```

The `\` at the end of a line means "the command goes on". If `mkfs` asks Proceed anyway? it has found yesterday's file system on this disk: answer **y**. Size: _____ Used: _____

**DONE WHEN** `df -h /mnt/backup` shows **your new partition**, not the system disk.

## TASK 2 A full backup

```
cd ~
ls -lh tramuntana-share/design/old
tar -czf /mnt/backup/wed-full.tgz tramuntana-share
ls -lh /mnt/backup
tar -tzf /mnt/backup/wed-full.tgz
```

`c` = create, `z` = compress, `f` = into this file; `t` = list.
Size of `promo-video.mp4`: _____ Size of the archive of the **whole** folder: _____
How can that be? (That video is 20 MB of zeros.)

_____

_____

**DONE WHEN** the list of the archive shows the folders `admin`, `design`, `dev` and `tmp`.

## TASK 3 Disaster and restore

Pau cleans the wrong folder. Stay in your home folder.

```
rm -r tramuntana-share/admin
ls tramuntana-share
```

Aina calls you. Bring back **only** her folder from the archive (`x` = extract):

```
tar -xzf /mnt/backup/wed-full.tgz \
  tramuntana-share/admin
ls tramuntana-share/admin
```

What is back?

_____

**DONE WHEN** `tramuntana-share/admin` exists again, with the invoices inside.

**TASK 4 · 10 MIN · IN PAIRS · ON PAPER**

## TASK 4 A week of backups

Sunday night: a **full** backup, 100 GB. Every working day, 2 GB of files are new or changed (other files each day). Size of the archive made each night:

| | Mon | Tue | Wed | Thu |
|---|---|---|---|---|
| Incremental | | | | |
| Differential | | | | |

The disk dies on Friday morning. Which archives do you need to restore?

Incremental: _____
Differential: _____

Wednesday's archive cannot be read. What can you still restore with each strategy?

_____

_____

**DONE WHEN** eight sizes, two lists of archives and one answer for each strategy.

**TASKS 5–7 · 25 MIN**

## TASK 5 A mirror with rsync

```
sudo apt install rsync
cd ~
rsync -av tramuntana-share/ /mnt/backup/mirror/
rsync -av tramuntana-share/ /mnt/backup/mirror/
```

Yes, twice. Mind the `/` after `tramuntana-share`. Bytes sent the first time: _____ the second time: _____

**DONE WHEN** the second run lists no files.

## TASK 6 Change, sync, delete

```
cd ~/tramuntana-share
echo 'new client' > admin/client-new.txt
echo 'v2' > design/logos/icon.svg
cd ~
rsync -av tramuntana-share/ /mnt/backup/mirror/
```

Which files travelled this time?

Now Pau deletes the Wi-Fi note, and you ask `rsync` what `--delete` **would** do:

```
rm tramuntana-share/admin/wifi.txt
rsync -av --delete --dry-run \
  tramuntana-share/ /mnt/backup/mirror/
ls /mnt/backup/mirror/admin
```

What does it announce? Did it do it? _____
Now for real:

```
rsync -av --delete \
  tramuntana-share/ /mnt/backup/mirror/
ls /mnt/backup/mirror/admin
```

Is `wifi.txt` in the mirror? _____ Get it back from the **archive** of task 2:

```
tar -xzf /mnt/backup/wed-full.tgz \
  tramuntana-share/admin/wifi.txt
ls tramuntana-share/admin
```

**DONE WHEN** `admin` has `client-new.txt`, `invoices`, `staff.csv` and `wifi.txt`.

## TASK 7 Prove it

Restore the whole archive into an empty folder (`-C` = extract into it) and compare it with the live data:

```
mkdir ~/rtest
tar -xzf /mnt/backup/wed-full.tgz -C ~/rtest
diff -rq ~/rtest/tramuntana-share tramuntana-share
```

Copy the lines that `diff` prints:

If the system disk died now and you only had this archive, what exactly would Tramuntana lose?

```
rm -r ~/rtest
```

**DONE WHEN** you named two things that exist only in the live data.

**Hand in** on Classroom, by Friday 05/02 at 23:59: `practical-4.6-surname.md`. One section per task: the command, the evidence and one sentence in your own words. Finish with three lines: does Tramuntana pass the 3-2-1 rule today? What is missing?

**Marking (10):** tasks 1–3 with evidence (the restore is shown) 3 · task 4 correct 2 · tasks 5–6 with the dry run explained 2 · task 7 and the 3-2-1 answer 2 · clear Markdown, your own words 1.

## EXIT TICKET

**1.** What does the 3-2-1 rule ask for?

- ☐ **A** 3 disks in RAID, 2 partitions, 1 file system
- ☐ **B** 3 copies, 2 kinds of storage, 1 copy in another place
- ☐ **C** 3 backups a day, 2 a week, 1 a month
- ☐ **D** 3 passwords, 2 users, 1 administrator

**2.** An incremental backup copies…

- ☐ **A** everything, every time
- ☐ **B** what changed since the last full backup
- ☐ **C** only the files you choose by hand
- ☐ **D** what changed since the last backup of any kind

**3.** What does `tar -tzf full.tgz` do?

- ☐ **A** Lists what is inside the archive
- ☐ **B** Extracts the archive
- ☐ **C** Creates the archive
- ☐ **D** Tests the disk

**4.** You delete a file in the original and run `rsync -av --delete` to the mirror. In the mirror, the file…

- ☐ **A** stays for ever
- ☐ **B** is renamed
- ☐ **C** is deleted too
- ☐ **D** is compressed

**5.** Full backup on Sunday, differential every night. The disk dies on Thursday morning. You need…

- ☐ **A** only Wednesday's archive
- ☐ **B** Sunday's full and Wednesday's differential
- ☐ **C** Sunday's full and Monday, Tuesday and Wednesday
- ☐ **D** every archive of the month