

Step by Step process to recover files from a failing drive, and other useful Linux tips.

*The following commands and tips are intended to be executed at the command line.
Command line, where one types commands... using correct syntax, spelling and spaces.*

NOTE: the following are standard special characters:

& ; | * ? ' " ` [] () \$ < > { } ^ # / \ % ! ~ -
(spaces also have great significance)

SITUATION: You have a system with a failing hard drive, or a hard drive from a failed, compromised, or corrupted system and need to recover a file or files. Your plan is to copy the files to a good hard drive. In many cases Microsoft Windows will NOT read the drive or even see it. In addition, if it has become infected with a virus you do NOT want to connect it to a Microsoft system. If the drive is not readable you may have to place it in a freezer for a while, once it's readable make your copies quickly! SATA drives fail more abruptly than IDE, and often with less warning.

ASSUMPTIONS: (assuming the problem is a Microsoft disk, but includes Linux too)

- 1) you have an “unreadable” SATA drive, and should NOT be mounted to a Microsoft system
- 2) you have a Linux system that either has disk space, or can attach to a good drive
- 3) you have a tool to connect the SATA drive via USB
- 4) you can read the drive on Linux, or can read it after freezing the drive in a freezer.

The following string of commands is captured from a live system. The process was captured using the “script” command which creates a complete log of all activity within a shell. The steps to clean up the capture are included.

OBJECTIVE: get the log file for a license application from the “failed” drive to a safe drive.

File location on original system: /var/tmp/comsol42.log

PROCESS OVERVIEW:

- 1) make sure you have root access as root user or via sudo.
- 2) attach the afflicted drive to the USB SATA tool
- 3) IGNORE any pop ups from automatic connection - do NOT use these.
- 4) as root, find the device and the correct file system (fdisk)
- 5) as root, created a mount point, e.g. /media/sdxx
- 6) as root, mount device to mount point
- 7) as root, if there is a problem, fsck that device, attempt mount again
- 8) if the device is incapable of being mounted or fsck'd... well... game over.
- 9) once mounted to /media/sdxx, find the destination directory, and begin copying files
- 10) once files are copied over unmount external drive.
- 11) NOTE: one can also use rsync, dd, or cp to copy the files, or to clone the drive.

ACTUAL PROCESS CAPTURED VIA "script":

files associated with consol log located in /var/tmp/ on external drive file system: /dev/sdc2

→ *script recover-file.raw*

--> *cat recover-file.txt*

Script started on Thu 26 Jun 2014 04:44:04 PM PDT

a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]

--> **sudo fdisk -l**

Disk /dev/sda: 750.2 GB, 750156374016 bytes, 1465149168 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x0f3e0f3d

Device	Boot	Start	End	Blocks	Id	System
/dev/sda1		2048	4208639	2103296	82	Linux swap / Solaris
/dev/sda2	*	4208640	46153727	20972544	83	Linux
/dev/sda3		46153728	1465147391	709496832	83	Linux

Disk /dev/sdb: 500.1 GB, 500107862016 bytes, 976773168 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x00073071

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1		2048	976773167	488385560	83	Linux

Disk /dev/sdc: 750.2 GB, 750156374016 bytes, 1465149168 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x0f3e0f3d

Device	Boot	Start	End	Blocks	Id	System
/dev/sdc1		2048	4208639	2103296	82	Linux swap / Solaris
/dev/sdc2	*	4208640	46153727	20972544	83	Linux
/dev/sdc3		46153728	1465147391	709496832	83	Linux

a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]

--> **more /etc/fstab**

```
/dev/sda1 swap          swap    defaults        0 0
/dev/sda2 /                    ext4    acl,user_xattr  1 1
/dev/sda3 /home                ext4    acl,user_xattr  1 2
#
```

```

# couldn't build by-id - revereted to kernel settings
# /dev/disk/by-id/ata-WDC_WD75_00AAKS-00RBA0_DCA044870388-0:0-part1 swap          swap  defaults      0 0
# /dev/disk/by-id/ata-WDC_WD75_00AAKS-00RBA0_DCA044870388-0:0-part2 /          ext4  acl,user_xattr  1 1
# /dev/disk/by-id/ata-WDC_WD75_00AAKS-00RBA0_DCA044870388-0:0-part3 /home    ext4  acl,user_xattr  1 2
# original drive
# /dev/disk/by-id/ata-WDC_WD7500AAKS-00RBA0_WD-WCAPT0419361-part1 swap          swap  defaults      0 0
# /dev/disk/by-id/ata-WDC_WD7500AAKS-00RBA0_WD-WCAPT0419361-part2 /          ext4  acl,user_xattr  1 1
# /dev/disk/by-id/ata-WDC_WD7500AAKS-00RBA0_WD-WCAPT0419361-part3 /home    ext4  acl,user_xattr  1 2
/dev/sdb1 /home/a_mere_mortal/web/.FILES      ext4  acl,user_xattr  1 1

```

```

-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
-----

```

```

--> mkdir /media/sdc2

```

```

mkdir: cannot create directory /media/sdc2: Permission denied

```

```

-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
-----

```

```

--> sudo mkdir /media/sdc2

```

```

-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
-----

```

```

--> sudo mount /dev/sdc2 /media/sdc2

```

```

-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
-----

```

```

--> df -h

```

```

Filesystem      Size  Used Avail Use% Mounted on
/dev/sda2       20G  18G  1.2G  94% /
devtmpfs        1.9G  32K  1.9G   1% /dev
tmpfs           1.9G  96K  1.9G   1% /dev/shm
tmpfs           1.9G  8.0M  1.9G   1% /run
tmpfs           1.9G   0  1.9G   0% /sys/fs/cgroup
tmpfs           1.9G  8.0M  1.9G   1% /var/run
tmpfs           1.9G  8.0M  1.9G   1% /var/lock
/dev/sda3       666G 173G 460G  28% /home
/dev/sdb1       459G 234G 202G  54% /home/a_mere_mortal/web/.FILES
/dev/sdc2       20G  15G  4.3G  78% /media/sdc2

```

```

-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
-----

```

```

--> mkdir RECOVER_FILE

```

```

-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
-----

```

```

--> ls -al /media/sdc2/var/tmp/

```

```

total 48
-rw-r--r-- 1 comsol comsolpid  0 Jun 19 13:20 comsol42.log
-rw-r--r-- 1 root  root    3192 Feb 21  2012 comsol42.log-21feb2012
drwx----- 6 root  root    4096 Feb  2  2012 kdecache-root
drwx----- 2 root  root    4096 Mar  1  2012 TmpDir.EPKDUI
drwx----- 2 root  root    4096 Feb 14  2012 TmpDir.oQPh0G
drwxr-xr-x  3 root  root    4096 Jul  7  2011 var

```

```
drwxrwxrwt 2 root root 4096 Jul 7 2011 342mvi.recover
drwx----- 4 root root 4096 Feb 14 2012 zypp.7wRNAq
drwx----- 4 root root 4096 Mar 1 2012 zypp.PkbnRb
```

```
-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
```

```
-----
cp -p comso* RECOVER_FILE/
```

```
-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
```

```
-----
--> ls -al RECOVER_FILE/
```

```
total 4
```

```
-rw-r--r-- 1 a_mere_mortal users 0 Jun 19 13:20 comsol42.log
-rw-r--r-- 1 a_mere_mortal users 3192 Feb 21 2012 comsol42.log-21feb2012
```

```
-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
```

```
-----
--> df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/sda2	20G	18G	1.2G	94%	/
devtmpfs	1.9G	32K	1.9G	1%	/dev
tmpfs	1.9G	96K	1.9G	1%	/dev/shm
tmpfs	1.9G	8.0M	1.9G	1%	/run
tmpfs	1.9G	0	1.9G	0%	/sys/fs/cgroup
tmpfs	1.9G	8.0M	1.9G	1%	/var/run
tmpfs	1.9G	8.0M	1.9G	1%	/var/lock
/dev/sda3	666G	173G	460G	28%	/home
/dev/sdb1	459G	234G	202G	54%	/home/a_mere_mortal/web/.FILES
/dev/sdc2	20G	15G	4.3G	78%	/media/sdc2

```
-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
```

```
-----
--> umount /media/sdc2
```

```
umount: /media/sdc2: umount failed: Operation not permitted
```

```
-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
```

```
-----
--> sudo umount /media/sdc2
```

```
-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
```

```
-----
--> df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/sda2	20G	18G	1.2G	94%	/
devtmpfs	1.9G	32K	1.9G	1%	/dev
tmpfs	1.9G	96K	1.9G	1%	/dev/shm
tmpfs	1.9G	8.0M	1.9G	1%	/run
tmpfs	1.9G	0	1.9G	0%	/sys/fs/cgroup
tmpfs	1.9G	8.0M	1.9G	1%	/var/run
tmpfs	1.9G	8.0M	1.9G	1%	/var/lock

```
/dev/sda3    666G 173G 460G 28% /home
/dev/sdb1    459G 234G 202G 54% /home/a_mere_mortal/web/.FILES
```

```
-----
a_mere_mortal@your_happy_linux_system [/home/a_mere_mortal]
-----
```

```
--> exit
exit
```

```
Script done on Thu 26 Jun 2014 04:47:06 PM PDT
```

```
→ --> exit
```

```
exit
```

```
Script done, file is recover-file.raw
```

```
→ cat recover-file.raw | col -b > recover-file.txt
```

```
→ vi recover-file.txt
```

TO MAKE A BACKUP COPY OF A FILE BEFORE and AFTER EDITING:

Create a shell script to use as a wrapper script. You can make a dedicated script for one file, as shown below, or use positional parameters to make the wrapper script save whatever file is passed.

```
--> more update-file.sh
```

```
#!/bin/bash
```

```
cp some-file-name.html ~/SAVE/`/bin/date +%Y%b%d-%H.%M`-some-file-name.html
```

```
vi some-file-name.html
```

```
cp some-file-name.html ~/SAVE/`/bin/date +%Y%b%d-%H.%M`-some-file-name.html
```