Récupération de données

SSTIC 2008

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PhotoRec
Récupération de fichiers

- Logiciel OpenSource (GPL)
- Fonctionne sous
  - DOS,
  - Windows,
  - Linux,
  - Mac OS X
  - FreeBSD, NetBSD, OpenBSD,
  - SunOS
  - Disponible sur http://www.cgsecurity.org

PhotoRec
Récupération de fichiers

- Reconnaît les entêtes des formats de fichiers les plus courants
  - Archives: 7z, bz2, gz, rar, tar, zip
  - Multimedia: asf, au, avi, wav, bmp, cdr, cr2, crw, ctg, dcr, dsc, fla, gif, jng, jpg, mng, mov, mp3, mp4, mpg, mrw, nef, ogg, orf, pcx, pef, png, psd, qxd, qxp, raf, raw, rdc, sit, sr2, tif, x3f, xcf
  - Office: doc, mdb, odd, odp, ods, odt, pap, ppt, rtf, sda, sdc, sdd, sdw, slk, sxc, sxd, sxi, sxw, txt, vis, xls
  - Divers: asp, bat, c, dbf, dbx, eps, exe, frm, h, html, jsp, myi, pdf, php, pl, prc, ps, pst, py, qdf, sh, wab

PhotoRec
Récupération de fichiers

- Capable de récupérer des données, y compris si le système de fichier est irréparable.
- Utilise la notion de bloc de taille fixe
  - FAT
  - NTFS
  - ext2/ext3
  - HFS+
- Effectue plusieurs passes pour tenter de récupérer les fichiers fragmentés

PhotoRec
Récupération de fichiers & Crypto

- Le fichier chiffré par GPG a été effacé par erreur.
- L'original n'existe plus, il a été supprimé de manière sécurisée avec la commande shred.
- Le répertoire .gnupg contenant le trousseau de clé a été victime lui aussi de l'effacement accidentel.
- Système de fichier ext3 sur une partition chiffrée.
- Passphrase GPG connue
- Passphrase LUKS connue

PhotoRec
Format OpenPGP

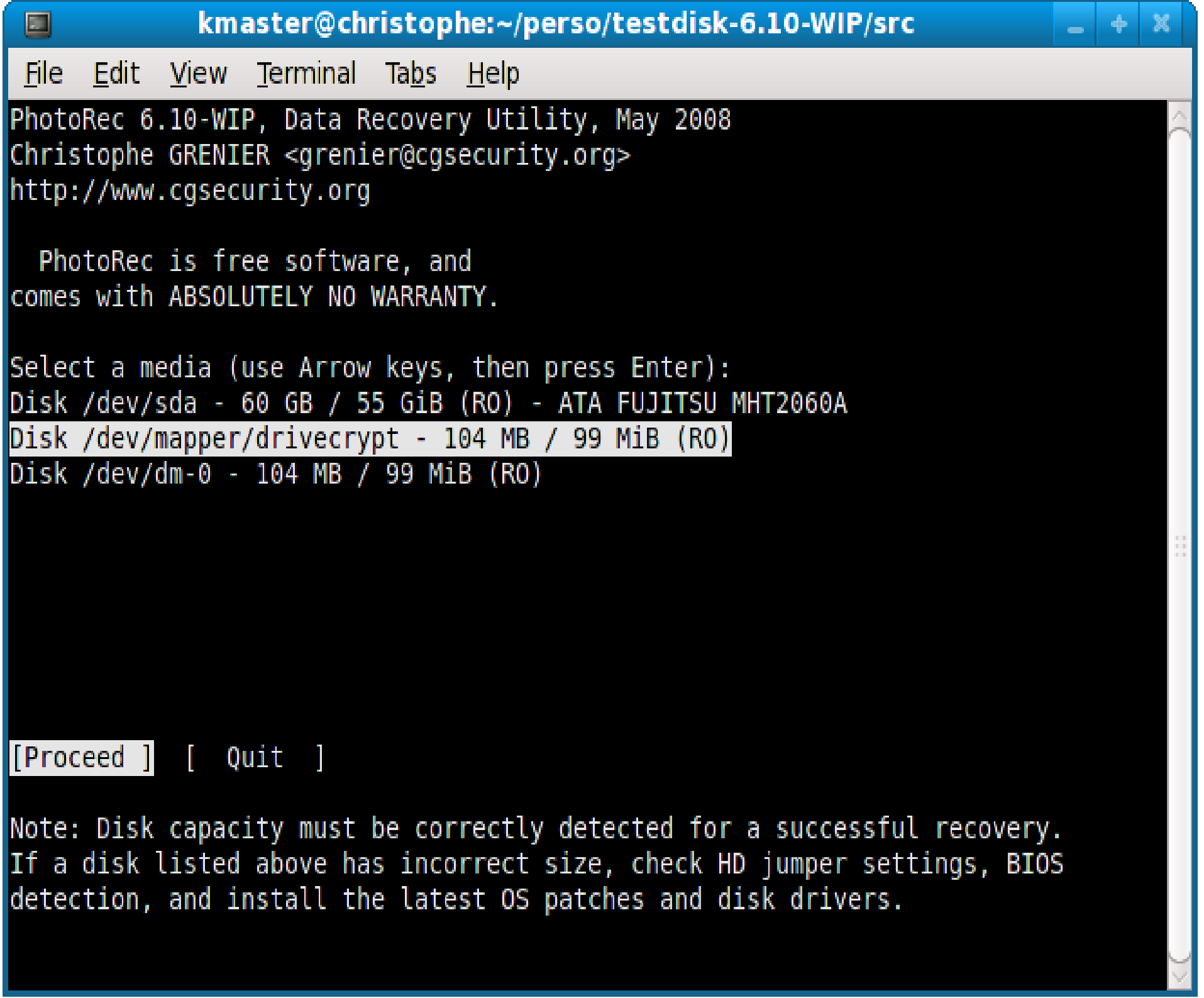
- RFC 2440
  Un message est formé d'une suite de paquets.
  paquet[0]&0x80=0x80
  T=type
  L=length
- Ancien format
  10TT TTLL (LLLL LLLL){1,2,4} (DDDD DDDD)*
- Nouveau format
  11TT TTTT (LLLL LLLL){1,2,5} (DDDD DDDD)*

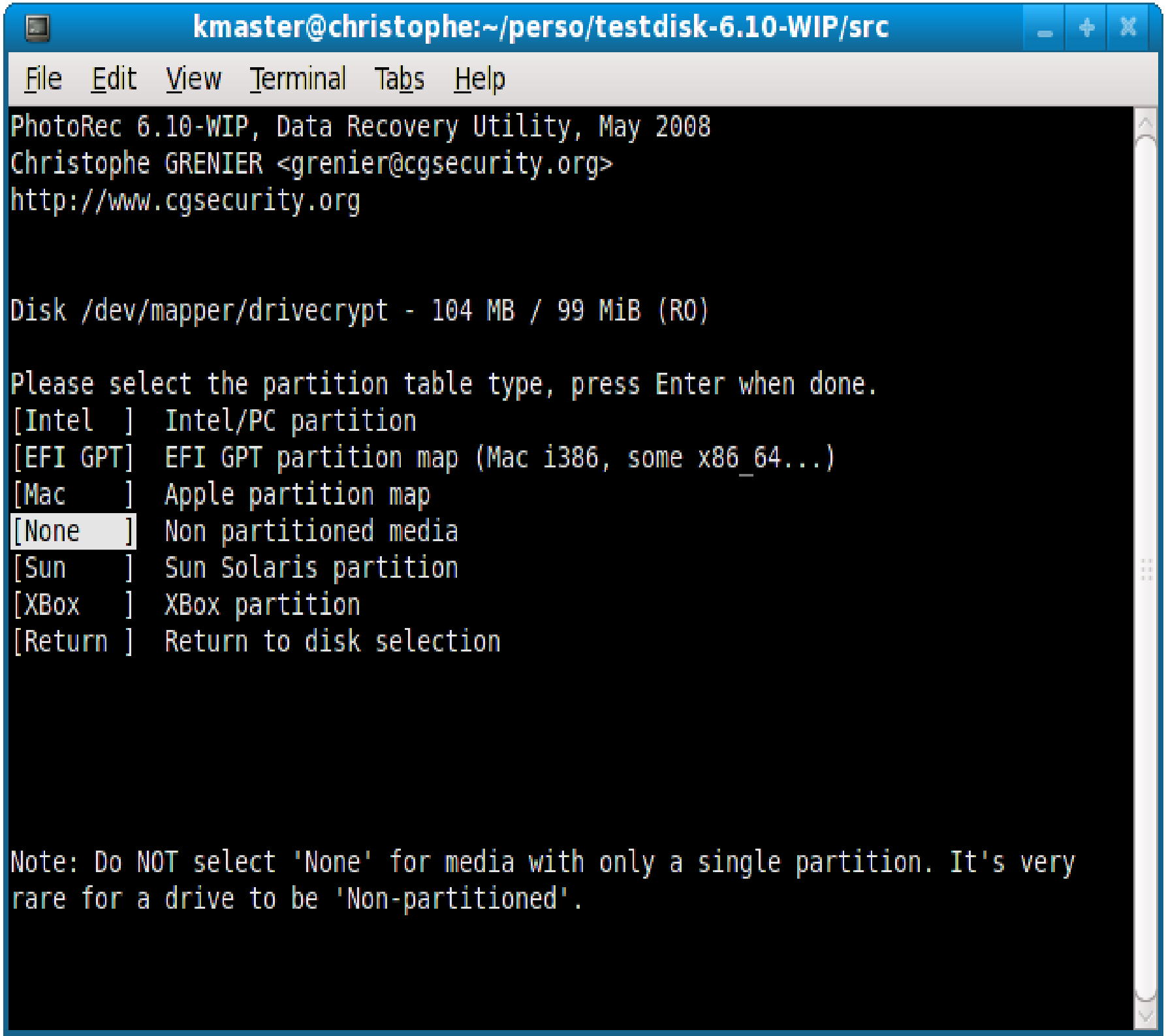
PhotoRec
Ext3

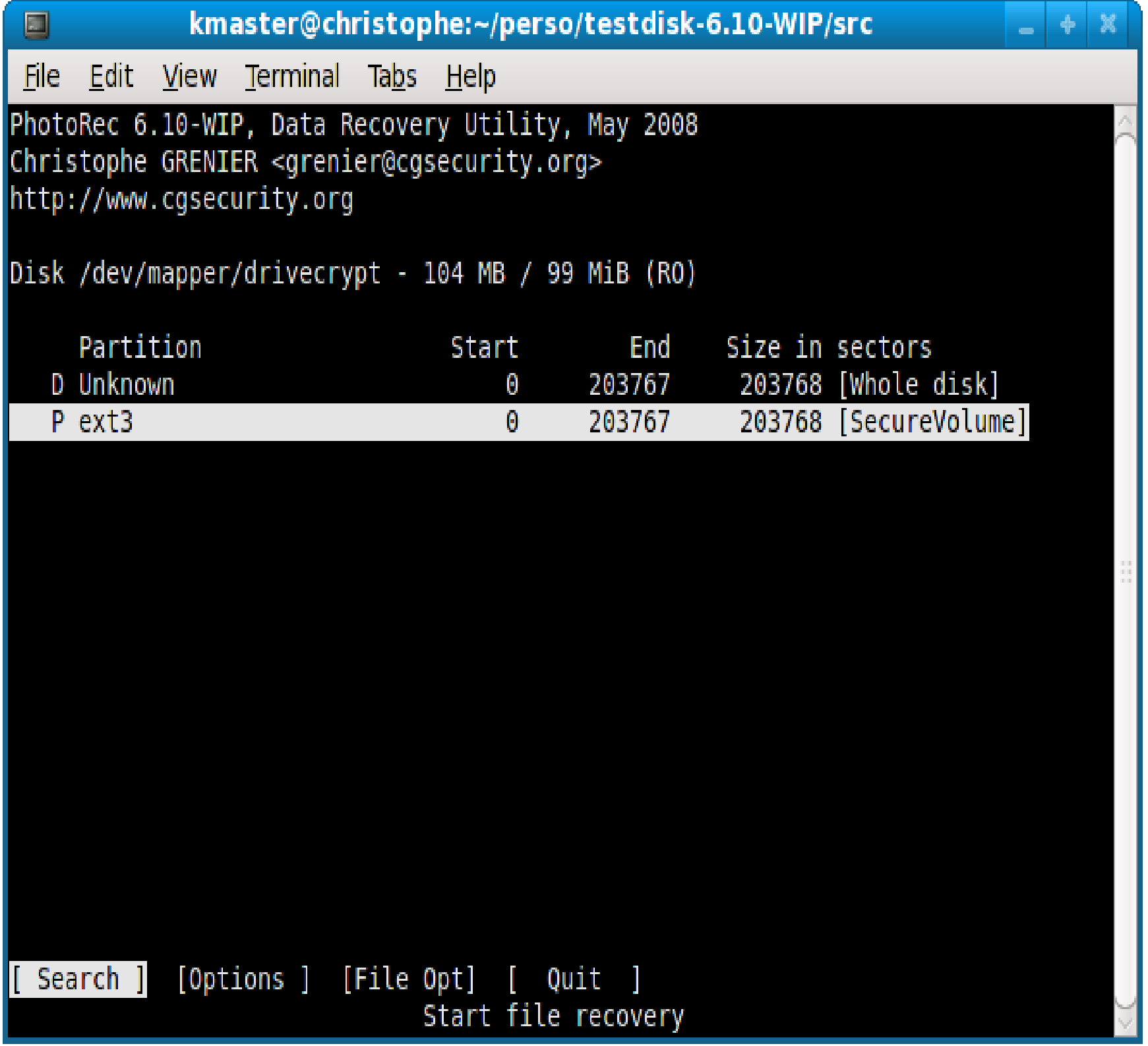
$ /usr/local/bin/**fls** -a ext3.dd
d/d 2: .
d/d 2: ..
d/d 11: lost+found
r/r 12: test.txt
r/r * 13: test2.txt

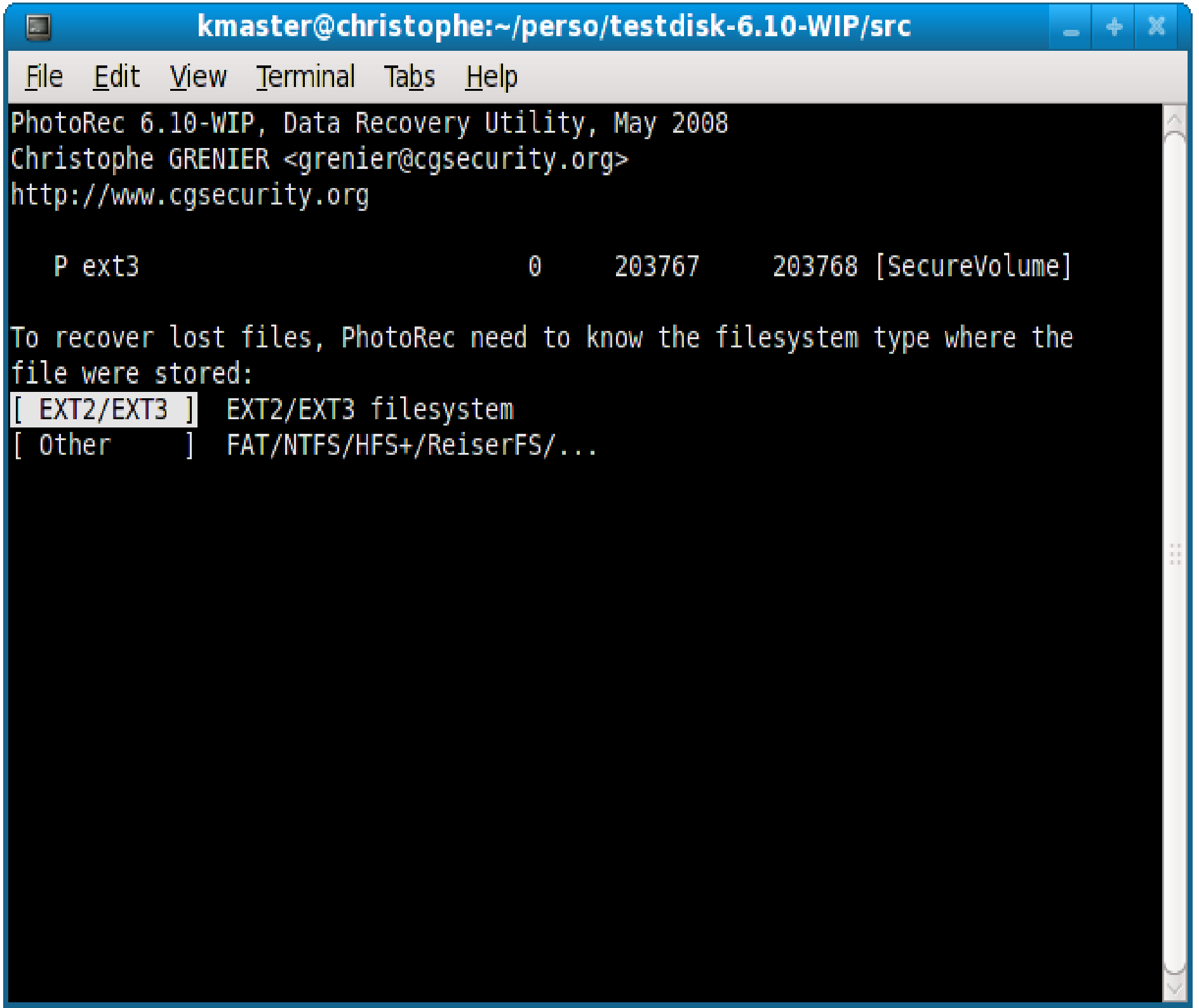
PhotoRec
Ext3

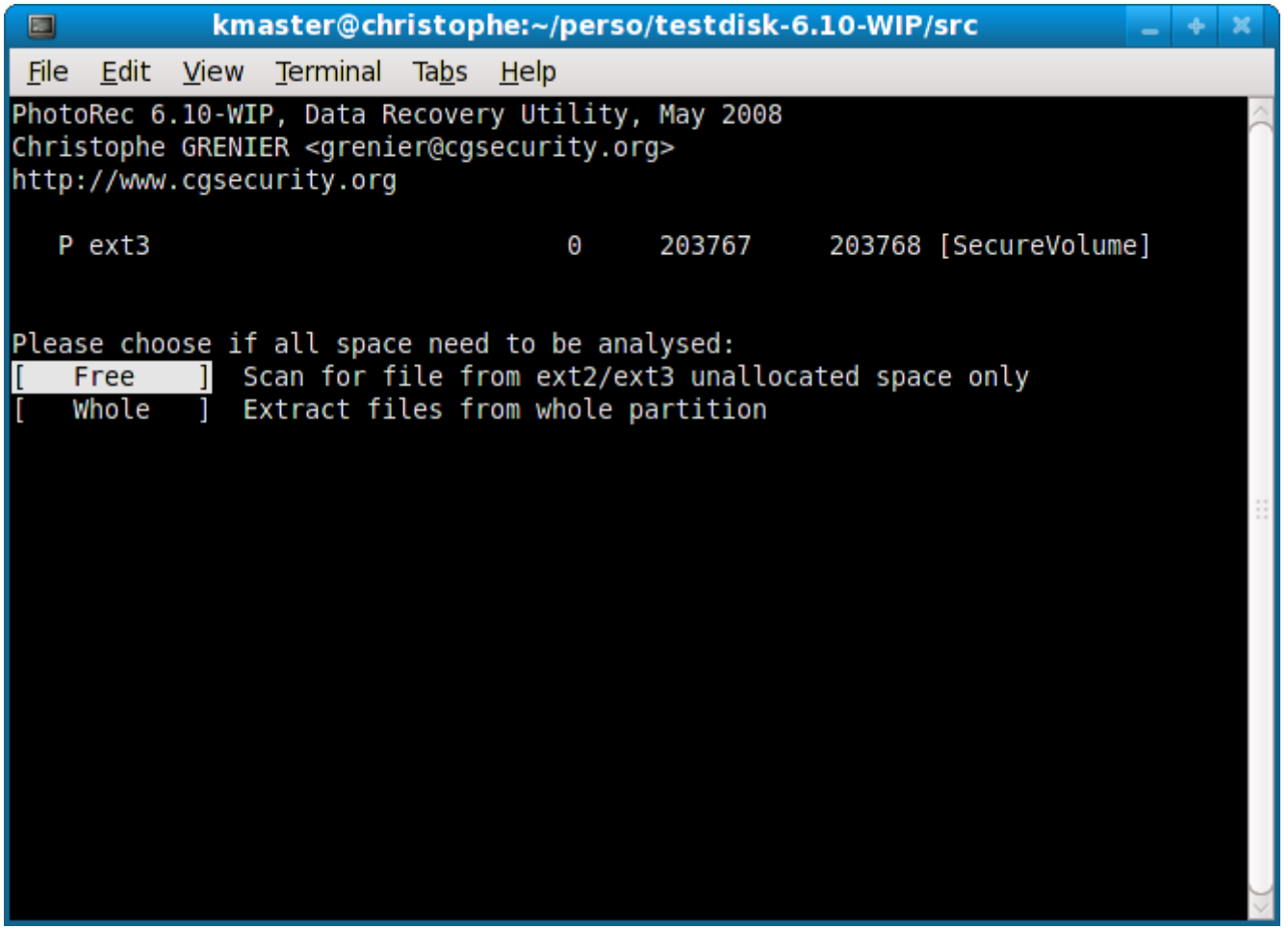
$ /usr/local/bin/**ils** -a ext3.dd
class|host|device|start_time
ils|christophe.global-secure.fr||1212523702
st_ino|st_alloc|st_uid|st_gid|st_mtime|st_atime|st_ctime|st_mode|st_nlink|**st_size|st_block0**|st_block1
1|a|0|0|1212522954|1212522954|1212522954|0|0|0|0|0
2|a|506|506|1212522956|1212522956|1212522956|40700|3|1024|364|0
7|a|0|0|1212522954|1212522954|1212522954|100600|1|67383296|0|0
8|a|0|0|1212522954|0|1212522954|100600|1|1048576|378|379
11|a|506|506|1212522954|1212522956|1212522956|40700|2|12288|365|366
12|a|506|506|1212522956|1212522956|1212522956|100664|1|**17|2561**|0
13|f|506|506|1212522956|1212522956|1212522956|100664|0|**0|0**|0

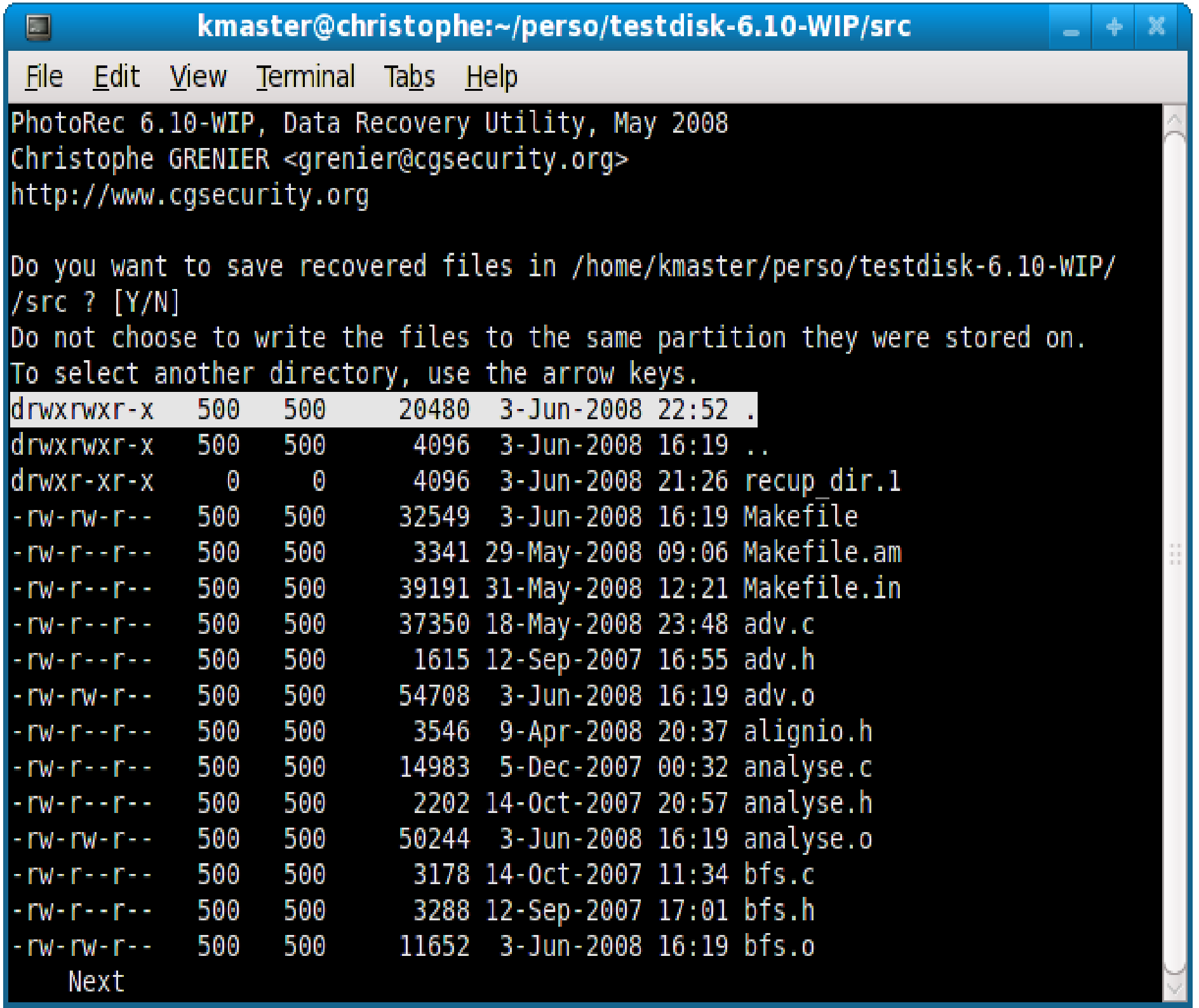

kmaster@christophe:~/perso/testdisk-6.10-WIP/src
File Edit View Terminal Tabs Help
PhotoRec 6.10-WIP, Data Recovery Utility, May 2008
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
PhotoRec is free software, and
comes with ABSOLUTELY NO WARRANTY.
Select a media (use Arrow keys, then press Enter):
Disk /dev/sda - 60 GB / 55 GiB (RO) - ATA FUJITSU MHT2060A
Disk /dev/mapper/drivecrypt - 104 MB / 99 MiB (RO)
Disk /dev/dm-0 - 104 MB / 99 MiB (RO)
[Proceed] [Quit]
Note: Disk capacity must be correctly detected for a successful recovery.
If a disk listed above has incorrect size, check HD jumper settings, BIOS
detection, and install the latest OS patches and disk drivers.

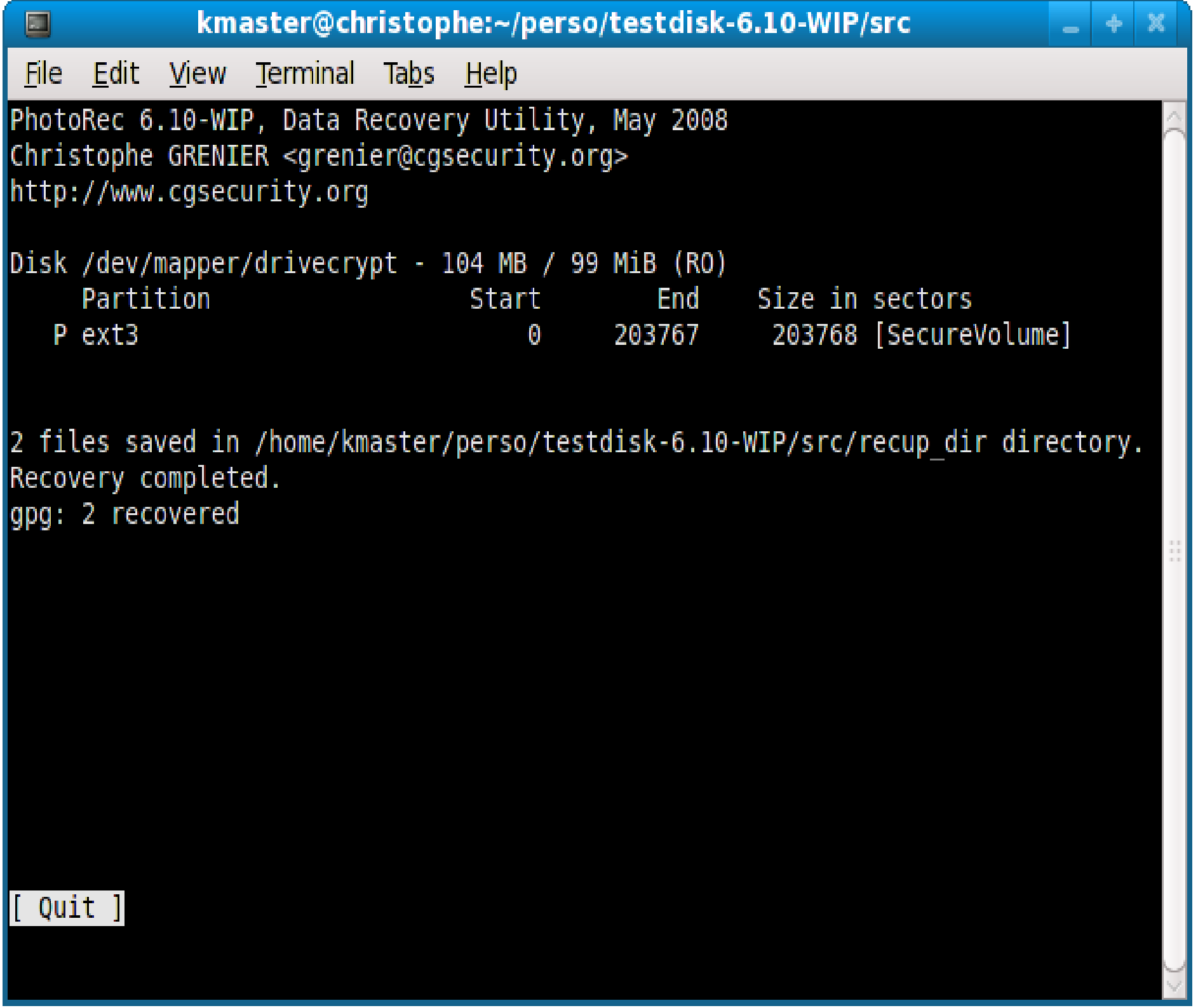

kmaster@christophe:~/perso/testdisk-6.10-WIP/src
File Edit View Terminal Tabs Help
PhotoRec 6.10-WIP, Data Recovery Utility, May 2008
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
Disk /dev/mapper/drivecrypt - 104 MB / 99 MiB (RO)
Please select the partition table type, press Enter when done.
[Intel] Intel/PC partition
[EFI GPT] EFI GPT partition map (Mac i386, some x86_64...)
[Mac] Apple partition map
[None] Non partitioned media
[Sun] Sun Solaris partition
[XBox] XBox partition
[Return] Return to disk selection
Note: Do NOT select 'None' for media with only a single partition. It's very
rare for a drive to be 'Non-partitioned'.


kmaster@christophe:~/perso/testdisk-6.10-WIP/src
File Edit View Terminal Tabs Help
PhotoRec 6.10-WIP, Data Recovery Utility, May 2008
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
Disk /dev/mapper/drivecrypt - 104 MB / 99 MiB (RO)
Partition Start End Size in sectors
D Unknown 0 203767 203768 [Whole disk]
P ext3 0 203767 203768 [SecureVolume]
[Search] [Options] [File Opt] [Quit]
Start file recovery


kmaster@christophe:~/perso/testdisk-6.10-WIP/src
File Edit View Terminal Tabs Help
PhotoRec 6.10-WIP, Data Recovery Utility, May 2008
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
P ext3 0 203767 203768 [SecureVolume]
To recover lost files, PhotoRec need to know the filesystem type where the file were stored:
[EXT2/EXT3] EXT2/EXT3 filesystem
[Other] FAT/NTFS/HFS+/ReiserFS/...


kmaster@christophe:~/perso/testdisk-6.10-WIP/src
File Edit View Terminal Tabs Help
PhotoRec 6.10-WIP, Data Recovery Utility, May 2008
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
P ext3 0 203767 203768 [SecureVolume]
Please choose if all space need to be analysed:
[Free] Scan for file from ext2/ext3 unallocated space only
[Whole] Extract files from whole partition


kmaster@christophe:~/perso/testdisk-6.10-WIP/src
File Edit View Terminal Tabs Help
PhotoRec 6.10-WIP, Data Recovery Utility, May 2008
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
Do you want to save recovered files in /home/kmaster/perso/testdisk-6.10-WIP/
/src ? [Y/N]
Do not choose to write the files to the same partition they were stored on.
To select another directory, use the arrow keys.
drwxrwxr-x 500 500 20480 3-Jun-2008 22:52 .
drwxrwxr-x 500 500 4096 3-Jun-2008 16:19 ..
drwxr-xr-x 0 0 4096 3-Jun-2008 21:26 recup_dir.1
-rw-rw-r-- 500 500 32549 3-Jun-2008 16:19 Makefile
-rw-r--r-- 500 500 3341 29-May-2008 09:06 Makefile.am
-rw-r--r-- 500 500 39191 31-May-2008 12:21 Makefile.in
-rw-r--r-- 500 500 37350 18-May-2008 23:48 adv.c
-rw-r--r-- 500 500 1615 12-Sep-2007 16:55 adv.h
-rw-rw-r-- 500 500 54708 3-Jun-2008 16:19 adv.o
-rw-r--r-- 500 500 3546 9-Apr-2008 20:37 alignio.h
-rw-r--r-- 500 500 14983 5-Dec-2007 00:32 analyse.c
-rw-r--r-- 500 500 2202 14-Oct-2007 20:57 analyse.h
-rw-rw-r-- 500 500 50244 3-Jun-2008 16:19 analyse.o
-rw-r--r-- 500 500 3178 14-Oct-2007 11:34 bfs.c
-rw-r--r-- 500 500 3288 12-Sep-2007 17:01 bfs.h
-rw-rw-r-- 500 500 11652 3-Jun-2008 16:19 bfs.o
Next


kmaster@christophe:~/perso/testdisk-6.10-WIP/src
File Edit View Terminal Tabs Help
PhotoRec 6.10-WIP, Data Recovery Utility, May 2008
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
Disk /dev/mapper/drivecrypt - 104 MB / 99 MiB (RO)
Partition Start End Size in sectors
P ext3 0 203767 203768 [SecureVolume]
2 files saved in /home/kmaster/perso/testdisk-6.10-WIP/src/recup_dir directory.
Recovery completed.
gpg: 2 recovered
[Quit]

PhotoRec
Fichiers récupérés

```
$ file recup_dir.1/*
recup_dir.1/f39946.gpg: PGP key security ring
recup_dir.1/f9490.gpg:  GPG encrypted data
```

PhotoRec
Fichier décrypté

```
gpg --no-default-keyring --try-all-secrets --secret-keyring
recup_dir.1/f39946.gpg recup_dir.1/f9490.gpg
gpg: anonymous recipient; trying secret key 06E3348F ...

You need a passphrase to unlock the secret key for
user: "[User ID not found]"

gpg: oops: public key not found for preference check
gpg: okay, we are the anonymous recipient.
gpg: encrypted with ELG-E key, ID 06E3348F
gpg: [don't know]: invalid packet (ctb=61)
gpg: mdc_packet with invalid encoding
gpg: decryption failed: invalid packet
gpg: WARNING: multiple plaintexts seen
gpg: handle plaintext failed: unexpected data
gpg: [don't know]: partial length for invalid packet type 24

[kmaster@christophe src]$ display recup_dir.1/f9490
```

Et voilà, l'image est déchiffrée

Merci à Cédric Blancher
http://sid.rstack.org
pour les photos

Plus d'info sur PhotoRec sur
http://www.cgsecurity.org