

- 
- GNU ddrescue:
- testdisk:
  - testdisk
  - photorec
- extundelete
- ext4magic
- R-Linux



- Astra Linux Special Edition .10015-01 ( 1.7), .10015-10
- Astra Linux Special Edition .10015-17
- Astra Linux Special Edition .10015-37 ( 7.7)
- Astra Linux Special Edition .10015-03 ( 7.6)
- Astra Linux Special Edition .10152-02 ( 4.7)
- Astra Linux Special Edition .10015-01 ( 1.6)
- Astra Linux Special Edition .10015-16 . 1
- Astra Linux Special Edition .10015-16 . 2
- Astra Linux Special Edition .10265-01 ( 8.1)
- Astra Linux Common Edition 2.12

, :

1. () ( ).
2. (/ , ).
3. ( ).

, .



, :

- . . . . . : S.M.A.R.T.
- . . . . .
- : , Live-USB, ;
- , , " " ( " " " " " " " " 1);
- ( cp, dd .), , .

## GNU ddrescue:



Web- GNU ddrescue: <https://www.gnu.org/software/ddrescue/>

GNU ddrescue ( dd\_rescue) () , .

GNU ddrescue Astra Linux Common Edition 2.12 :

```
sudo apt install gddrescue
```

Astra Linux Special Edition [Astra Linux Common Edition](#).

:

```
sudo ddrescue [<>] <_> <_> [<>]
```

:

1. " " . " " ( ).
2. , " " . " " , . , .
1. " " (non-tried). " " .
2. . . , " " (non-trimmed).
3. . , . ( ) . " " " " " " " " (non-scraped).
4. " " , , " " (bad-sector).



"" , .

: (, /dev/sdb), (/dev/sdb1), .

(. man ddrescue):

- -r N - ;
- -i NNN - ;
- -d - ;
- -f - ( , , ).
- -n - "" ;
- -A - .

:

- 1. /dev/sdh - file.tmp map.tmp:

```
sudo ddrescue /dev/sdh file.tmp map.tmp
```

GNU ddrescue 1.21

Press Ctrl-C to interrupt

ipos: 120034 MB, non-trimmed: 0 B, current rate: 24576 B

/s

opos: 120034 MB, non-scraped: 0 B, average rate: 23968 kB

/s

non-tried: 0 B, bad-sector: 0 B, error rate: 0 B

/s

rescued: 120034 MB, bad areas: 0, run time: 1h 23m

27s

pct rescued: 100.00%, read errors: 0, remaining time: n

/a

time since last successful read: n

/a

Finished

- 2. , . , , , 3 , (-d):

```
sudo ddrescue -f -d -r3 /dev/sdh file.tmp map.tmp
```



:

- .
- testdisk - .
- photorec - .
- . , , - . :
  - partx kpartx ( partx kpartx);
  - losetup ( klibc-utils);
  - mount - , , ( . ).

, , .

- 3. /dev/sdb1 /dev/sdc1 ( ). :

```
sudo ddrescue -f /dev/sdb1 /dev/sdc1 partmap.tmp
```

```
sudo ddrescue -f -r3 /dev/sdb1 /dev/sdc1 partmap.tmp
```

- 4. -(, - , ):

◦ , ( , , ):

```
sudo ddrescue -f -r3 -i 1234567000 /dev/sdb /dev/sdc map.tmp
```

◦ :

```
sudo ddrescue -f -r3 -R /dev/sdb /dev/sdc map.tmp
```

◦ ( ):

```
sudo ddrescue -f -r3 -A /dev/sdb /dev/sdc map.tmp
```

- 5. -. - (/dev/sdc), (/dev/sdd) :

```
sudo ddrescue -f -m map.tmp /dev/sdc /dev/sdd newmap.tmp
sudo ddrescue -f -n /dev/sdb /dev/sdd newmap.tmp
sudo ddrescue -f -d -r3 /dev/sdb /dev/sdd newmap.tmp
```

## testdisk:



WEB- TestDisk: <http://www.cgsecurity.org>  
: TestDisk Documentation

testdisk Astra Linux, , :

```
sudo apt install testdisk
```

:

- testdisk - ;
- photorec - ;

## testdisk

testdisk , , ( , , .). (/dev/sdb) , . :

- .
- FAT32/NTFS .
- FAT12/FAT16/FAT32/NTFS.
- FAT.
- MFT MFT.
- ext2/ext3/ext4 ( fsck - .).
- FAT/exFAT/NTFS/ext2.
- FAT/exFAT/NTFS/ext2/ext3/ext4.

.

( , , ):

```
sudo testdisk /dev/sdb
```

testdisk - .

:

TestDisk 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

TestDisk is free software, and  
comes with ABSOLUTELY NO WARRANTY.

Select a media (use Arrow keys, then press Enter):  
>Disk /dev/sdb - 8589 MB / 8192 MiB - VBOX HARDDISK

>[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.

Enter, :

TestDisk 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

Disk /dev/sdb - 8589 MB / 8192 MiB - VBOX HARDDISK

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...)  
[Humax ] Humax partition table  
[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 disk to be 'Non-partitioned'.



testdisk , , . ( "[None ] Non partitioned media"). ( "[Intel] Intel/PC partition") .

, Enter, :

TestDisk 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

Disk /dev/sdb - 8589 MB / 8192 MiB - VBOX HARDDISK  
CHS 1044 255 63 - sector size=512

>[ Analyse ] Analyse current partition structure and search for lost partitions  
[ Advanced ] Filesystem Utils  
[ Geometry ] Change disk geometry  
[ Options ] Modify options  
[ MBR Code ] Write TestDisk MBR code to first sector  
[ Delete ] Delete all data in the partition table  
[ Quit ] Return to disk selection

Note: Correct disk geometry is required for a successful recovery. 'Analyse'  
process may give some warnings if it thinks the logical geometry is mismatched.

"Analyze" :

, . . - "Quick Search" ( " ) Enter, "" . "" ().

TestDisk 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

Disk /dev/sdb - 8589 MB / 8192 MiB - CHS 1044 255 63  
Partition Start End Size in sectors  
>\* Linux 0 32 33 510 14 16 8192000 [first]  
P Linux 510 14 17 1044 85 1 8583168 [second]

Structure: Ok. Use Up/Down Arrow keys to select partition.  
Use Left/Right Arrow keys to CHANGE partition characteristics:  
\*=Primary bootable P=Primary L=Logical E=Extended D=Deleted  
Keys A: add partition, L: load backup, T: change type, P: list files,  
Enter: to continue  
ext4 blocksize=4096 Large\_file Sparse\_SB, 4194 MB / 4000 MiB

Enter, :

TestDisk 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

Disk /dev/sdb - 8589 MB / 8192 MiB - CHS 1044 255 63

	Partition	Start	End	Size in sectors
1	* Linux	0 32 33	510 14 16	8192000 [first]
2	P Linux	510 14 17	1044 85 1	8583168 [second]

[ Quit ] >[Deeper Search] [ Write ]  
Try to find more partitions

"" ("Deep Search"), ("Write").

"Advanced":

TestDisk 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

Disk /dev/sdb - 8589 MB / 8192 MiB - VBOX HARDDISK  
CHS 1044 255 63 - sector size=512

[ Analyse ] Analyse current partition structure and search for lost partitions  
>[ Advanced ] Filesystem Utils  
[ Geometry ] Change disk geometry  
[ Options ] Modify options  
[ MBR Code ] Write TestDisk MBR code to first sector  
[ Delete ] Delete all data in the partition table  
[ Quit ] Return to disk selection

Note: Correct disk geometry is required for a successful recovery. 'Analyse'  
process may give some warnings if it thinks the logical geometry is mismatched.

:

```
TestDisk 7.0, Data Recovery Utility, April 2015
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
```

```
Disk /dev/sdb - 8589 MB / 8192 MiB - CHS 1044 255 63
```

```

      Partition      Start      End      Size in sectors
> 1 * Linux          0 32 33  510 14 16 8192000 [first]
  2 P Linux          510 14 17 1044 85  1 8583168 [second]
```

```
[ Type ] >[Superblock] [ List ] [Image Creation] [ Quit ]
Locate ext2/ext3/ext4 backup superblock
```

:

- Type - , ;
- Superblock - fsck. ( ). , fsck:

```
TestDisk 7.0, Data Recovery Utility, April 2015
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
```

```
Disk /dev/sdb - 8589 MB / 8192 MiB - CHS 1044 255 63
```

```

      Partition      Start      End      Size in sectors
Linux          0 32 33  510 14 16 8192000 [first]
superblock 0, blocksize=4096 [first]
superblock 32768, blocksize=4096 [first]
superblock 98304, blocksize=4096 [first]
superblock 163840, blocksize=4096 [first]
superblock 229376, blocksize=4096 [first]
superblock 294912, blocksize=4096 [first]
superblock 819200, blocksize=4096 [first]
superblock 884736, blocksize=4096 [first]
```

```
To repair the filesystem using alternate superblock, run
fsck.ext4 -p -b superblock -B blocksize device
```

- List - ;
- Image Creation - ;

```
Ext4, Astra Linux, testparm ("q") ,:
```

```
sudo fsck.ext4 -p -b 32768 -B 4096 /dev/sdb1
```

## photorec

photorec , , .



, , .

testdisk, , :

```
sudo photorec /dev/sdb1
```

:

PhotoRec 7.0, Data Recovery Utility, April 2015  
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/sdb1 - 4194 MB / 4000 MiB (RO) - VBOX HARDDISK  
>[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.

Enter.

"File Opt" - :

PhotoRec 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

Disk /dev/sdb1 - 4194 MB / 4000 MiB (RO) - VBOX HARDDISK

Partition	Start	End	Size in sectors
Unknown	0 0 1	509 236 47	8192000 [Whole disk]
> P ext4	0 0 1	509 236 47	8192000 [first]

>[ Search ] [Options ] [File Opt] [ Quit ]  
Start file recovery

, "":

hotoRec 7.0, Data Recovery Utility, April 2015  
Christophe GRENIER <grenier@cgsecurity.org>  
<http://www.cgsecurity.org>

PhotoRec will try to locate the following files

```
>[X] custom Own custom signatures
[X] lcd Russian Finance 1C:Enterprise 8
[X] 3dm Rhino / openNURBS
[X] 7z 7zip archive file
[X] DB
[X] a Unix Archive/Debian package
[X] abr Adobe Brush
[X] acb Adobe Color Book
[X] accdb Access Data Base
[X] ace ACE archive
[X] ab MAC Address Book
[X] ado Adobe Duotone Options
[X] ahn Ahnenblatt
[X] aif Audio Interchange File Format
[X] all Cubase Song file: .all
[X] als Ableton Live Sets
[X] amd AlphaCAM (amd/amt/atd/att)
[X] amr Adaptive Multi-Rate
[X] apa APA Style Helper
[X] ape Monkey's Audio compressed format
[X] apple AppleSingle/AppleDouble
[X] ari ARRI Raw Video
[X] arj ARJ archive
[X] asf ASF, WMA, WMV: Advanced Streaming Format used for Audio/Video
[X] asl Adobe Layer Style
[X] asm Pro/ENGINEER Assembly
[X] atd Agelong Tree Database/Abs0luteDatabase
[X] au Sun/NeXT audio data
[X] axx AxCrypt
[X] bac Bacula backup
[X] db Berkeley DB (Little Endian)
[X] bim Broadcast Interface Module
[X] binvox Binvox Voxel File
[X] bkf MS Backup file
[X] blend blender
[X] bmp BMP bitmap image
[X] bz2 bzip2 compressed data
[X] cab Microsoft Cabinet archive
[X] caf Core Audio Format
[X] cam Casio QV Digital Camera Image
[X] catdrawing CATIA
[X] cdt cdl/cdt/cdd Concept Draw
[X] chm MS Windows HtmlHelp Data
[X] class Java Class
[X] comicdoc Comic Life
[X] cp_ MS compress file (SZDD)
[X] cow Qemu Image
[X] crw Canon Raw picture
Next
Press s to disable all file families, b to save the settings
>[ Quit ]
Return to main menu
```

, Enter.  
, , Enter:



```
PhotoRec 7.0, Data Recovery Utility, April 2015
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
```

```
P ext4 0 0 1 509 236 47 8192000 [first]
```

To recover lost files, PhotoRec need to know the filesystem type where the file were stored:

```
>[ ext2/ext3 ] ext2/ext3/ext4 filesystem
[ Other ] FAT/NTFS/HFS+/ReiserFS/...
```

("Free" - , "Whole" - ) Enter:

```
PhotoRec 7.0, Data Recovery Utility, April 2015
Christophe GRENIER <grenier@cgsecurity.org>
http://www.cgsecurity.org
```

```
P ext4 0 0 1 509 236 47 8192000 [first]
```

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
```

"C", .

## extundelete

extundelete Astra Linux, .

```
sudo apt install extundelete
```

```
sudo extundelete --restore-all /dev/sdh1
```

```
NOTICE: Extended attributes are not restored.
Loading filesystem metadata ... 232 groups loaded.
Loading journal descriptors ... Segmentation fault
```

## ext4magic



ext4magic Astra Linux Debian: <http://ftp.de.debian.org/debian/pool/main/e/ext4magic/>.

man ext4magic, :

1. () :

```
sudo ext4magic -M /dev/___
```

2. :

```
sudo ext4magic -m /dev/___
```

RECOVERED .

# R-Linux

Web- R-Tools Technology: <https://www.r-tt.com/ru/>

R-Linux — Ext2/Ext3/Ext4, Linux Unix (). - R-Tools Technology (). , . , .

R-Linux Web- :

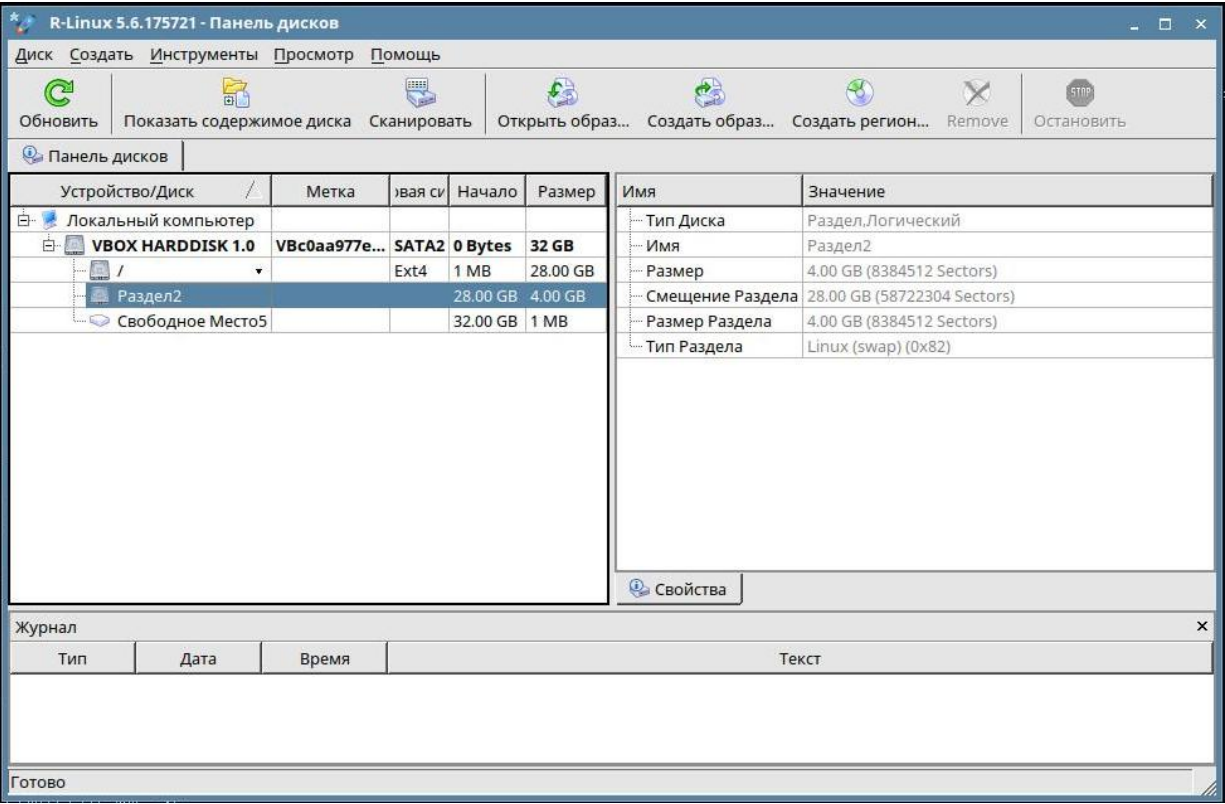
```
wget https://www.r-studio.com/downloads/RLinux5_x64.deb
sudo apt install ./RLinux5_x64.deb
```

"" , :

```
sudo rlinux
```



:



( ), . / .  
, , , R-Link .  
R-Linux S.M.A.R.T , .