



Can your diff(1) do this?!

Improving software review & QA with diffoscope

Chris Lamb
@lolamby
Debian Project Leader

foss-north.se
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Gothenburg, Sweden

Hallå!



Open source developer for 10+ years

Debian Project Leader

opensource.org board member

Freelance software developer

< zed0> can you get cp to give a progress bar like wget?

Damn right you can.

```
#!/bin/sh
cp_p()
{
    strace -q -ewrite cp -- "${1}" "${2}" 2>&1 \
    | awk '{
        count += $NF
        if (count % 10 == 0) {
            percent = count / total_size * 100
            printf "%3d%% [" , percent
            for (i=0;i<=percent;i++)
                printf "="
            printf ">"
            for (i=percent;i<100;i++)
                printf " "
            printf "]\r"
        }
    }
    END { print "" }' total_size=$(stat -c '%s' "${1}") count=0
}
```

In action:

```
% cp_p /mnt/raid/pub/iso/debian/debian-2.2r4potato-i386-netinst.iso /dev/null
76% [=====>]
```

File Edit View Go Bookmarks Help

Previous Next 1 (1 of 1) 85%

7	8	4	1	9	3	6	5	2
9	1	2	5	7	6	3	8	4
6	3	5	8	4	2	1	7	9
4	5	7	6	3	9	2	1	8
8	9	3	7	2	1	5	4	6
2	6	1	4	5	8	9	3	7
3	2	8	9	1	4	7	6	5
5	4	9	3	6	7	8	2	1
1	7	6	2	8	5	4	9	3

Sudoku Solver in PostScript



Why?

Source code available for free software...

... everyone runs binaries

Do they correspond?

Build farms

Developer's machines

Blackmail, law-enforcement...

1. Ensure build have identical results
2. Multiple parties compare results
3. Attacker must infect everybody simultaneously

Identical results?

```
$ sha1sum *.deb
```

```
6f84a299013682203ca2c8345b7b1735e5c575ff  a.deb
```

```
85ced2fcdced7a7c3ad31c5e1fa382665e3922f0  b.deb
```



```

$ diff -urNad <(xxd a.deb) <(xxd b.deb) | head -n20
--- /proc/self/fd/13      2018-01-23 11:51:56.299697293 +1100
+++ /proc/self/fd/14      2018-01-23 11:51:56.299697293 +1100
@@ -5,10 +5,10 @@
 00000040: 2020 600a 322e 300a 636f 6e74 726f 6c2e      `.2.0.control.
 00000050: 7461 722e 787a 2020 3134 3936 3438 3535  tar.xz  14964855
 00000060: 3332 2020 3020 2020 2020 3020 2020 2020  32  0      0
-00000070: 3130 3036 3434 2020 3136 3634 2020 2020  100644  1664
+00000070: 3130 3036 3434 2020 3136 3638 2020 2020  100644  1668
 00000080: 2020 600a fd37 7a58 5a00 0004 e6d6 b446      `..7zXZ.....F
-00000090: 04c0 bf0c 8050 2101 1600 0000 0000 0000  .....P!.....
-000000a0: 8adc 344d e027 ff06 375d 0017 0bbc 1c7d  ..4M.'..7].....}
+00000090: 04c0 c30c 8050 2101 1600 0000 0000 0000  .....P!.....
+000000a0: e2fe ae8d e027 ff06 3b5d 0017 0bbc 1c7d  .....'.;].....}
 000000b0: 0195 c01d 4a3e 7915 c2cc 26a3 5930 12c7  ....J>y...&.Y0..
 000000c0: 788e 24a0 72a5 b416 6144 2d0f 073c 6a5f  x.$..r...aD-...<j_
 000000d0: 0ad7 2255 a796 3502 6c20 fa2a 3248 5c80  .."U..5.l .*2H\..
@@ -52,10105 +52,10099 @@
 00000330: f7c4 ab30 9b57 c0fb 161f 96fd 789f 8cc0  ...0.W.....x...
 00000340: 3683 9e02 b7de e805 98ea a09f a4af aaa1  6.....
 00000350: 6575 7d72 d91b 1252 9e39 d172 025c d429  eu}r...R.9.r.\.)

```

```
$ ar x a.deb && ar x b.deb
```

```
$ diff -urNad <(xxd a-control.tar.xz) <(xxd b-control.tar.xz) | head -n10
```

```
--- /proc/self/fd/13      2018-01-23 12:24:53.316388212 +1100
```

```
+++ /proc/self/fd/14      2018-01-23 12:24:53.316388212 +1100
```

```
@@ -1,6 +1,6 @@
```

```
-00000000: fd37 7a58 5a00 0004 e6d6 b446 04c0 bf0c  .7zXZ.....F....
```

```
-00000010: 8050 2101 1600 0000 0000 0000 8adc 344d  .P!.....4M
```

```
-00000020: e027 ff06 375d 0017 0bbc 1c7d 0195 c01d  .'...7].....}....
```

```
+00000000: fd37 7a58 5a00 0004 e6d6 b446 04c0 c30c  .7zXZ.....F....
```

```
+00000010: 8050 2101 1600 0000 0000 0000 e2fe ae8d  .P!.....
```

```
+00000020: e027 ff06 3b5d 0017 0bbc 1c7d 0195 c01d  .'...;].....}....
```

```
00000030: 4a3e 7915 c2cc 26a3 5930 12c7 788e 24a0  J>y...&.Y0..x.$.
```

```
$ unxz a-control.tar.xz && unxz b-control.tar.xz
```

```
$ diff -urNad <(xxd a-control.tar) <(xxd b-control.tar) | head -n10
```

```
--- /proc/self/fd/13      2018-01-23 12:26:28.564994785 +1100
```

```
+++ /proc/self/fd/14      2018-01-23 12:26:28.564994785 +1100
```

```
@@ -158,8 +158,8 @@
```

```
000009d0: 0000 0000 0000 0000 0000 0000 0000 0000  ....
```

```
000009e0: 0000 0000 0000 0000 0000 0000 0000 0000  ....
```

```
000009f0: 0000 0000 0000 0000 0000 0000 0000 0000  ....
```

```
-00000a00: 3031 3063 3964 6534 6461 6434 3562 6137  010c9de4dad45ba7
```

```
-00000a10: 3661 6265 6231 6539 3932 3032 6164 3132  6abeb1e99202ad12
```

```
+00000a00: 3436 3135 3165 3139 3236 3631 6162 3663  46151e192661ab6c
```

```
+00000a10: 6366 6234 3136 3737 3833 3166 3639 3534  cfb41677831f6954
```

```
$ tar xf a-control.tar && tar xf b-control.tar
```

```
$ diff -urNad a-md5sums b-md5sums
```

```
--- a-md5sums      2017-06-03 20:25:32.000000000 +1000
```

```
+++ b-md5sums      2017-06-03 20:25:32.000000000 +1000
```

```
@@ -1,4 +1,4 @@
```

```
-010c9de4dad45ba76abeb1e99202ad12  usr/bin/pnmixer
```

```
+46151e192661ab6ccfb41677831f6954  usr/bin/pnmixer
```

```
7a14b41780e873903f62d14dd16edc25  usr/share/applications/pnmixer.desktop
```

```
3d244715045bc4e9f2417fa4fd652cb8  usr/share/doc/pnmixer/README.md.gz
```

```
b9e4e837497f0f1b41bbcb26553eb8a4  usr/share/doc/pnmixer/changelog.Debian.gz
```


I SHOULD BUILD A BETTER DIFF



```
$ diffoscope a b
```

```
--- a
```

```
+++ b
```

```
@@ -1 +1 @@
```

```
-foo
```

```
+bar
```

Archive formats

```
$ tar cf a.tar a
```

```
$ tar cf b.tar b
```

```
$ diffoscope a.tar b.tar
```

```
--- a.tar
```

```
+++ b.tar
```

```
— file list
```

```
@@ -1 +1 @@
```

```
--rw-r--r-- 0 lamby (1000) lamby (1000) 4 2018-01-22 22:31:51.000000 a
```

```
+rw-r--r-- 0 lamby (1000) lamby (1000) 4 2018-01-22 22:31:50.000000 b
```

```
--- a
```

```
— +++ b
```

```
@@ -1 +1 @@
```

```
-foo
```

```
+bar
```

Compressed formats

```
$ gzip a.tar
```

```
$ gzip b.tar
```

```
$ diffoscope a.tar.gz b.tar.gz
```

```
--- a.tar.gz
```

```
+++ b.tar.gz
```

```
— filetype from file(1)
```

```
@@ -1 +1 @@
```

```
-gzip compressed data, was "a.tar", last modified: Mon Jan 22 22:32:04 2018, from Unix
```

```
+gzip compressed data, was "b.tar", last modified: Mon Jan 22 22:32:08 2018, from Unix
```

```
--- a.tar
```

```
+++ b.tar
```

```
— file list
```

```
@@ -1 +1 @@
```

```
--rw-r--r-- 0 lamby (1000) lamby (1000) 4 2018-01-22 22:31:51.000000 a
```

```
+rw-r--r-- 0 lamby (1000) lamby (1000) 4 2018-01-22 22:31:50.000000 b
```

```
--- a
```

```
+++ b
```

```
@@ -1 +1 @@
```

```
-foo
```

```
+bar
```

Recursive

```
├─ hunspell-de-de_20131206-5_all.deb
│   ├── control.tar.gz
│   │   ├── control.tar
│   │   │   ├── md5sums
│   │   │   └─ ... Files in package differs
│   └─ data.tar.xz
│       ├── data.tar
│       │   └─ ./usr/share/hunspell/de_DE.aff
│       │       @@ -1,11 +1,11 @@
│       │       # this is the affix file of the de_DE Hunspell dictionary
│       │       # derived from the igerman98 dictionary
│       │       #
│       │       -# Version: 20131206 (build 20150801)
│       │       +# Version: 20131206 (build 20150802)
│       │       #
```

Line ordering

```
$ cat a
```

```
These  
lines  
are  
in  
order
```

```
$ cat b
```

```
These  
order  
are  
in  
lines
```

```
$ diffoscope a b
```

```
--- a
```

```
+++ b
```

```
|... ordering differences only
```

```
@@ -1,5 +1,5 @@
```

```
These
```

```
-lines
```

```
+order
```

```
are
```

```
in
```

```
-order
```

```
+lines
```

HTML output

test1.sqlite3 vs.
test2.sqlite3

219 B

sqlite3 {} .dump

Offset 1, 5 lines modified

```
1 PRAGMA foreign_keys=OFF;
2 BEGIN TRANSACTION;
3 CREATE TABLE test (value val);
4 INSERT INTO test VALUES(1);
5 COMMIT;
```

193 B

Offset 1, 5 lines modified

```
1 PRAGMA foreign_keys=OFF;
2 BEGIN TRANSACTION;
3 CREATE TABLE test (value val);
4 INSERT INTO test VALUES(2);
5 COMMIT;
```

Android boot ROMs, Android APKs, ar archives, bzip2 files, Coreboot cbfs, CPIO archives, Dalvik dex file, Debian packages, device (mknod), device tree globs, directories, docx, ELF binaries, ext filesystem images, fontconfig cache dirs, fonts, gettext catalogues, GIF images, Git repositories, GZip files, Haskell binaries, ICC colour profiles, ISO images, Java, bytecode, Javascript, JSON, LLVM binaries, Macho binaries, Mono executables, odt documentens, Ogg borbis, OpenSSH keys, Pascal binaries, PDF files, PGP/GPG keys, PNG images, PostScript, RPM images, R statistical data, Rust binaries, SQLite databases, squashfs images, symlinks, tar archives, tcpdump dumps, text files, XML documents, XZ files, ZIP archives ...

Android images

test1.apk vs.
test2.apk

1.5 KB

zipinfo /dev/stdin

348 B

Offset 1, 3 lines modified

```
1 Zip file size: 866 bytes, number of entries: 1
2 -rw----- 2.0 fat 2096 bl defN 80-Jan-01 02:00
  AndroidManifest.xml
3 1 file, 2096 bytes uncompressed, 714 bytes compressed: 65.9%
```

Offset 1, 3 lines modified

```
1 Zip file size: 864 bytes, number of entries: 1
2 -rw----- 2.0 fat 2096 bl defN 80-Jan-01 02:00
  AndroidManifest.xml
3 1 file, 2096 bytes uncompressed, 712 bytes compressed: 66.0%
```

AndroidManifest.xml (decoded)

942 B

AndroidManifest.xml

884 B

Offset 1, 9 lines modified

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <manifest android:versionCode="1" android:versionName="1.0"
  package="com.any.any" platformBuildVersionCode="24"
  platformBuildVersionName="7.0.0" xmlns:android="http://
  schemas.android.com/apk/res/android">
3   <uses-permission android:name="android.permission.
  INTERNET"/>
4   <uses-permission android:name="android.permission.
  ACCESS_COARSE_LOCATION"/>
5   <uses-permission android:name="android.permission.
  ACCESS_FINE_LOCATION"/>
6   <application>
7     <activity android:name="com.any.any.SomeActivity">
8       <intent-filter>
9         <action android:name="android.intent.action.MAIN"/>
```

Offset 1, 9 lines modified

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <manifest android:versionCode="2" android:versionName="2.0"
  package="com.any.any" platformBuildVersionCode="24"
  platformBuildVersionName="7.0.0" xmlns:android="http://
  schemas.android.com/apk/res/android">
3   <uses-permission android:name="android.permission.
  INTERNET"/>
4   <uses-permission android:name="android.permission.
  ACCESS_COARSE_LOCATION"/>
5   <uses-permission android:name="android.permission.
  ACCESS_FINE_LOCATION"/>
6   <application>
7     <activity android:name="com.any.any.SomeActivity">
8       <intent-filter>
9         <action android:name="android.intent.action.MAIN"/>
```

APK metadata

224 B

Offset 11, 9 lines modified

```
11 unknownFiles: {}
12 usesFramework:
13   ids:
14     1
15   tag: null
16 version: 2.3.2-dirty
17 versionInfo:
18   versionCode: '1'
19   versionName: '1.0'
```

Offset 11, 9 lines modified

```
11 unknownFiles: {}
12 usesFramework:
13   ids:
14     1
15   tag: null
16 version: 2.3.2-dirty
17 versionInfo:
18   versionCode: '2'
19   versionName: '2.0'
```

Berkeley DB databases

test1.db vs.
test2.db

1.65 KB

Berkeley DB file

1.64 KB

Offset 9, 61 lines modified

```
9  » magic: 0x53162
10 » version: 9
11 » pagesize: 4096
12 » type: 9
13 » metaflags: 0
14 » keys: 0 » records: 0
15 » free_list: 0
16 » last_pgno: 7
17 » flags: 0x20 (multiple-databases)
18 » minkey: 2
19 » root: 1
20 page 1: btree leaf: LSN [0][1]: level 1
21 » prev: 0 next: 0 entries: 6 offset: 4000
22 » [000] 4040 len: 19 data: unstable|main|amd64
23 » [001] 4032 len: 4 data: 00000004
24 » [002] 4072 len: 18 data: unstable|main|1386
25 » [003] 4064 len: 4 data: 00000002
26 » [004] 4008 len: 20 data: unstable|main|source
27 » [005] 4000 len: 4 data: 00000006
28 page 2: btree metadata: LSN [0][1]: level 0
29 » magic: 0x53162
30 » version: 9
31 » pagesize: 4096
32 » type: 9
33 » metaflags: 0
34 » keys: 0 » records: 0
35 » free_list: 0
36 » last_pgno: 2
37 » flags: 0x20 (multiple-databases)
38 » minkey: 2
39 » root: 3
40 page 3: btree leaf: LSN [0][1]: level 1
41 » prev: 0 next: 0 entries: 0 offset: 4096
42 page 4: btree metadata: LSN [0][1]: level 0
43 » magic: 0x53162
44 » version: 9
45 » pagesize: 4096
46 » type: 9
47 » metaflags: 0
48 » keys: 0 » records: 0
49 » free_list: 0
50 » last_pgno: 4
51 » flags: 0x20 (multiple-databases)
52 » minkey: 2
53 » root: 5
54 page 5: btree leaf: LSN [0][1]: level 1
55 » prev: 0 next: 0 entries: 0 offset: 4096
```

Offset 9, 29 lines modified

```
9  » magic: 0x53162
10 » version: 9
11 » pagesize: 4096
12 » type: 9
13 » metaflags: 0
14 » keys: 0 » records: 0
15 » free_list: 0
16 » last_pgno: 3
17 » flags: 0x20 (multiple-databases)
18 » minkey: 2
19 » root: 1
20 page 1: btree leaf: LSN [0][1]: level 1
21 » prev: 0 next: 0 entries: 2 offset: 4064
22 » [000] 4072 len: 19 data: compressedfilelists
23 » [001] 4064 len: 4 data: 00000002
24 page 2: btree metadata: LSN [0][1]: level 0
25 » magic: 0x53162
26 » version: 9
27 » pagesize: 4096
28 » type: 9
29 » metaflags: 0
30 » keys: 0 » records: 0
31 » free_list: 0
32 » last_pgno: 2
33 » flags: 0x20 (multiple-databases)
34 » minkey: 2
35 » root: 3
36 page 3: btree leaf: LSN [0][1]: level 1
37 » prev: 0 next: 0 entries: 0 offset: 4096
```

Microsoft Word .docx

test1.docx vs.
test2.docx

54.0 B

docx2txt

34.0 B

Offset 1, 1 lines modified

Offset 1, 1 lines modified

1 a

1 b

Ebooks

test1.epub vs.
test2.epub

3.38 KB

zipinfo /dev/stdin

1.52 KB

Offset 1, 11 lines modified	Offset 1, 11 lines modified
1 Zip-file size: 3320 bytes, number of entries: 9	1 Zip-file size: 3317 bytes, number of entries: 9
2 -rw-----0.0 fat 20 b - stor 15-Oct-27 11:32 mimetype	2 -rw-----0.0 fat 20 b - stor 15-Oct-27 11:33 mimetype
3 -rw-----0.0 fat 246 b - defX 15-Oct-27 11:32 META-INF/container.xml	3 -rw-----0.0 fat 246 b - defX 15-Oct-27 11:33 META-INF/container.xml
4 -rw-----0.0 fat 160 b - defX 15-Oct-27 11:32 META-INF/com.apple.ibooks.display-options.xml	4 -rw-----0.0 fat 160 b - defX 15-Oct-27 11:33 META-INF/com.apple.ibooks.display-options.xml
5 -rw-----0.0 fat 439 b - defX 15-Oct-27 11:32 stylesheet.css	5 -rw-----0.0 fat 439 b - defX 15-Oct-27 11:33 stylesheet.css
6 -rw-----0.0 fat 529 b - defX 15-Oct-27 11:32 title_page.xhtml	6 -rw-----0.0 fat 529 b - defX 15-Oct-27 11:33 title_page.xhtml
7 -rw-----0.0 fat 1129 b - defX 15-Oct-27 11:32 content.opf	7 -rw-----0.0 fat 1129 b - defX 15-Oct-27 11:33 content.opf
8 -rw-----0.0 fat 742 b - defX 15-Oct-27 11:32 toc.ncx	8 -rw-----0.0 fat 742 b - defX 15-Oct-27 11:33 toc.ncx
9 -rw-----0.0 fat 655 b - defX 15-Oct-27 11:32 nav.xhtml	9 -rw-----0.0 fat 655 b - defX 15-Oct-27 11:33 nav.xhtml
10 -rw-----0.0 fat 615 b - defX 15-Oct-27 11:32 ch001.xhtml	10 -rw-----0.0 fat 615 b - defX 15-Oct-27 11:33 ch001.xhtml
11 9 files, 4535 bytes uncompressed, 2328 bytes compressed: ..48.7%	11 9 files, 4535 bytes uncompressed, 2325 bytes compressed: ..48.7%

content.opf

1.0 KB

Offset 1, 13 lines modified	Offset 1, 13 lines modified
1 <?xml version="1.0" encoding="UTF-8"?>	1 <?xml version="1.0" encoding="UTF-8"?>
2 <package version="2.0" xmlns="http://www.idpf.org/2007/opf" unique-identifier="epub-id-1">	2 <package version="2.0" xmlns="http://www.idpf.org/2007/opf" unique-identifier="epub-id-1">
3 ..<metadata xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:opf="http://www.idpf.org/2007/opf">	3 ..<metadata xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:opf="http://www.idpf.org/2007/opf">
4<dc:identifier id="epub-id-1">urn:uuid:488fe0b5-29d9-4d64-a023-ca08947d78ae</dc:identifier>	4<dc:identifier id="epub-id-1">urn:uuid:c3082605-195c-4273-acad-528beceba843</dc:identifier>
5<dc:title id="epub-title-1">Test Ebook</dc:title>	5<dc:title id="epub-title-1">Test Ebook</dc:title>
6<dc:date id="epub-date-1">2015-10-27T11:32:54Z</dc:date>	6<dc:date id="epub-date-1">2015-10-27T11:33:20Z</dc:date>
7<dc:language>en-US</dc:language>	7<dc:language>en-US</dc:language>
8 ..</metadata>	8 ..</metadata>
9 ..<manifest>	9 ..<manifest>
10<item id="ncx" href="toc.ncx" media-type="application/xhtml+xml" />	10<item id="ncx" href="toc.ncx" media-type="application/xhtml+xml" />
11<item id="style" href="stylesheet.css" media-type="text/css" />	11<item id="style" href="stylesheet.css" media-type="text/css" />
12<item id="nav" href="nav.xhtml" media-type="application/xhtml+xml" />	12<item id="nav" href="nav.xhtml" media-type="application/xhtml+xml" />
13<item id="title_page_xhtml" href="title_page.xhtml" media-type="application/xhtml+xml" />	13<item id="title_page_xhtml" href="title_page.xhtml" media-type="application/xhtml+xml" />

toc.ncx

536 B

Offset 1, 11 lines modified	Offset 1, 11 lines modified
1 <?xml version="1.0" encoding="UTF-8"?>	1 <?xml version="1.0" encoding="UTF-8"?>
2 <ncx version="2005-1" xmlns="http://www.daisy.org/z3986/2005/1/ncx">	2 <ncx version="2005-1" xmlns="http://www.daisy.org/z3986/2005/1/ncx">

Mono binaries

test1.exe vs.
test2.exe

398 B

pedump {}

Offset 1, 12 lines modified

```
1 COFF-Header:
2 » .....Machine: 0x014c
3 » .....Sections: 0x0003
4 » .....Time-stamp: 0x55a2d5bb
5 » Pointer to Symbol Table: 0x00000000
6 » .....Symbol Count: 0x00000000
7 » ...Optional Header Size: 0x00e0
8 » .....Characteristics: 0x0102

9 PE-Header:
10 » .....Magic (0x010b): 0x010b
```

Offset 1, 12 lines modified

```
1 COFF-Header:
2 » .....Machine: 0x014c
3 » .....Sections: 0x0003
4 » .....Time-stamp: 0x55a2d5bd
5 » Pointer to Symbol Table: 0x00000000
6 » .....Symbol Count: 0x00000000
7 » ...Optional Header Size: 0x00e0
8 » .....Characteristics: 0x0102

9 PE-Header:
10 » .....Magic (0x010b): 0x010b
```

380 B

git(1) repositories

test1.git-index vs.
test2.git-index

463 B

test1.git-index vs.
test2.git-index

433 B

Offset 10, 7 lines modified

```
10 User-ID:···1000
11 Group-ID:···1000
12 Created:···1471689380.154572964
13 Modified:···1471689380.154572964
14 Inode:·····52205983
15 Device-ID:·(8,·6)
```

Offset 10, 18 lines modified

```
10 User-ID:···1000
11 Group-ID:···1000
12 Created:···1471689380.154572964
13 Modified:···1471689380.154572964
14 Inode:·····52205983
15 Device-ID:·(8,·6)
16 Path:·····b'b'
17 SHA:·····e69de29bb2d1d6434b8b29ae775ad8c2e48c5391
18 Size:·····0
19 Flags:·····0b1
20 User-ID:···1000
21 Group-ID:···1000
22 Created:···1471689417.184218147
23 Modified:···1471689417.184218147
24 Inode:·····52206041
25 Device-ID:·(8,·6)
```

Gnumeric spreadsheets

test1.gnumeric vs.
test2.gnumeric

68.0 B

ssconvert

40.0 B

Offset 1, 1 lines modified

Offset 1, 1 lines modified

1 foo

1 bar

ISO images

a.iso vs.
b.iso

74.6 KB

live/filesystem.squashfs

74.3 KB

unsquashfs -s {}

470 B

Offset 1, 10 lines modified

Offset 1, 10 lines modified

```
1 Found a valid SQUASHFS 4:0 superblock
2 Creation or last append time Wed Jan 17 16:08:
  29 2018
3 Filesystem size 1139612.52 Kbytes (1112.90
  Mbytes)
4 Compression xz
5 » Dictionary size 1048576
6 » Filters selected: x86
7 Block size 1048576
8 Filesystem is not exportable via NFS
9 Inodes are compressed
10 Data is compressed
```

```
1 Found a valid SQUASHFS 4:0 superblock
2 Creation or last append time Thu Jan 25 16:46:
  09 2018
3 Filesystem size 1139612.62 Kbytes (1112.90
  Mbytes)
4 Compression xz
5 » Dictionary size 1048576
6 » Filters selected: x86
7 Block size 1048576
8 Filesystem is not exportable via NFS
9 Inodes are compressed
10 Data is compressed
```

unsquashfs -d " -lls {}

7.72 KB



Image content

5.79 KB

Pixel difference



Flicker difference



Offset 1, 36 lines modified

```
1
2
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```

Offset 1, 36 lines modified

```
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31
32
33
34
35
36
```



JSON

```
$ cat a.json  
{"key": "value", "other-key": "after"}
```

```
$ cat b.json  
{"other-key": "before", "key": "value"}
```

```
$ diffoscope a.json b.json  
--- a.json  
+++ b.json  
|  
|   --- a.json  
|   +++ b.json  
|@@ -1,4 +1,4 @@  
|   {  
|       "key": "value",  
|   -   "other-key": "after"  
|   +   "other-key": "before"  
|   }
```

OpenDocument text documents

test1.odt vs. test2.odt		58.0 B
odt2txt Offset 1, 3 lines modified		40.0 B
1 a	1 b	

Ogg audio files

test1.ogg vs.
test2.ogg

35.1 KB

oggDump

35.1 KB

Offset 1, 108 lines modified

```
1 Found vorbis stream with ID=0x5d79
2 Ogg Page: header length = 28 and body length = 30
3 Header Information:
4 » Ogg Version .....: 0
5 » Serial No .....: 0x5d79
6 » Packet Type .....: fresh packet
7 » Page Type .....: begin of stream marker
8 » Last Page .....: normal page
9 » Granule Position : 0(0x0)
10 » Page Number .....: 0
11 » Checksum .....: 0x83300c0a
12 » Table Segments ..: 1
```

13 Segments:

14 ·1e

15 Header Hex dump: ·

```
16 ·4f·67·67·53·00·02·00·00·00·00·00·00·00·00·79·5d
17 ·00·00·00·00·00·00·0a·0c·30·83·01·1e
```

18 Body Hex dump: ·

```
19 ·01·76·6f·72·62·69·73·00·00·00·00·02·44·ac·00·00·ff·ff·ff·ff·
20 00·f4·01·00·ff·ff·ff·ff·b8·01
```

20 Ogg Page: header length = 44 and body length = 4153

21 Header Information:

```
22 » Ogg Version .....: 0
23 » Serial No .....: 0x5d79
24 » Packet Type .....: fresh packet
25 » Page Type .....: normal page
26 » Last Page .....: normal page
27 » Granule Position : 0(0x0)
28 » Page Number .....: 1
29 » Checksum .....: 0x9b00a0ae
30 » Table Segments ..: 17
```

31 Segments:

```
32 ·49·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff
33 ·ff
```

34 Header Hex dump: ·

```
35 ·4f·67·67·53·00·00·00·00·00·00·00·00·00·00·79·5d
36 ·00·00·01·00·00·00·ae·a0·00·9b·11·49·ff·ff·ff·ff
37 ·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff
```

38 Body Hex dump: ·

```
39 ·03·76·6f·72·62·69·73·39·00·00·00·42·53·3b·20·4c·61·6e·63·65·
72·28·53·53·45·29·20·5b·32·30·30·36
```

Offset 1, 102 lines modified

```
1 Found vorbis stream with ID=0xeb4dfcaa
2 Ogg Page: header length = 28 and body length = 30
3 Header Information:
4 » Ogg Version .....: 0
5 » Serial No .....: 0xeb4dfcaa
6 » Packet Type .....: fresh packet
7 » Page Type .....: begin of stream marker
8 » Last Page .....: normal page
9 » Granule Position : 0(0x0)
10 » Page Number .....: 0
11 » Checksum .....: 0x686500e6
12 » Table Segments ..: 1
```

13 Segments:

14 ·1e

15 Header Hex dump: ·

```
16 ·4f·67·67·53·00·02·00·00·00·00·00·00·00·00·aa·fc
17 ·4d·eb·00·00·00·00·e6·00·65·68·01·1e
```

18 Body Hex dump: ·

```
19 ·01·76·6f·72·62·69·73·00·00·00·00·02·44·ac·00·00·00·00·00·00·
80·b5·01·00·00·00·00·00·b8·01
```

20 Ogg Page: header length = 44 and body length = 3896

21 Header Information:

```
22 » Ogg Version .....: 0
23 » Serial No .....: 0xeb4dfcaa
24 » Packet Type .....: fresh packet
25 » Page Type .....: normal page
26 » Last Page .....: normal page
27 » Granule Position : 0(0x0)
28 » Page Number .....: 1
29 » Checksum .....: 0xaeafd68da
30 » Table Segments ..: 17
```

31 Segments:

```
32 ·40·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff
33 ·07
```

34 Header Hex dump: ·

```
35 ·4f·67·67·53·00·00·00·00·00·00·00·00·00·00·aa·fc
36 ·4d·eb·01·00·00·00·da·68·fd·ea·11·40·ff·ff·ff·ff
37 ·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·ff·07
```

38 Body Hex dump: ·

```
39 ·03·76·6f·72·62·69·73·0d·00·00·00·4c·61·76·66·35·37·2e·35·36·
2e·31·30·31·01·00·00·00·1f·00·00·00
```

tcpdump(1) capture files

test1.pcap vs.
test2.pcap

613 KB

tcpdump

613 KB

stderr from `tcpdump -X -nn -tttt -r test1.pcap`:

reading from file test1.pcap, link-type EN10MB (Ethernet)

stderr from `tcpdump -X -nn -tttt -r test2.pcap`:

reading from file test2.pcap, link-type EN10MB (Ethernet)

Offset 1, 299 lines modified

Offset 1, 158 lines modified

```
1 00:00:00.000000 IP 172.17.0.1.5353->224.0.0.251.5353: 0
PTR (QM)?_googlecast._tcp.local.(40)
2 » 0x0000: 4500 0044 3cec 4000 0111 afaf ac11 0001 E..
D<.@.....
3 » 0x0010: e000 00fb 14e9 14e9 0030 8d4f 0000 0000 ...
.....0.0....
4 » 0x0020: 0001 0000 0000 0000 0b5f 676f 6f67 6c65 ...
....._google
5 » 0x0030: 6361 7374 045f 7463 7005 6c6f 6361 6c00 ..
cast._tcp.local.
6 » 0x0040: 000c 0001 .....
.
7 00:00:00.000036 IP6 fe80::42:84ff:fe0a:124b.5353->ff02::fb.
5353: 0 PTR (QM)?_googlecast._tcp.local.(40)
8 » 0x0000: 600a 59c7 0030 1101 fe80 0000 0000 0000 ..
Y..@.....
9 » 0x0010: 0042 84ff fe0a 124b ff02 0000 0000 0000 ..B.
....K.....
10 » 0x0020: 0000 0000 0000 00fb 14e9 14e9 0030 9457 ....
.....@.W
11 » 0x0030: 0000 0000 0001 0000 0000 0000 0b5f 676f ....
....._go
12 » 0x0040: 6f67 6c65 6361 7374 045f 7463 7005 6c6f ..
oglecast._tcp.lo
13 » 0x0050: 6361 6c00 000c 0001 .....
cal.....
14 00:00:00.000090 IP6 fe80::50fc:25ff:fe42:cef1.5353->ff02::
fb.5353: 0 PTR (QM)?_googlecast._tcp.local.(40)
15 » 0x0000: 600d e287 0030 1101 fe80 0000 0000 0000 ..
..@.....
16 » 0x0010: 50fc 25ff fe42 cef1 ff02 0000 0000 0000 P.
%..B.....
17 » 0x0020: 0000 0000 0000 00fb 14e9 14e9 0030 42f0 ....
.....@B.
18 » 0x0030: 0000 0000 0001 0000 0000 0000 0b5f 676f ....
....._go
19 » 0x0040: 6f67 6c65 6361 7374 045f 7463 7005 6c6f ..
oglecast._tcp.lo
20 » 0x0050: 6361 6c00 000c 0001 .....
cal.....
21 00:00:00.001299 IP 172.17.0.1.5353->224.0.0.251.5353: 0
PTR (QM)?_googlecast._tcp.local.(40)
22 » 0x0000: 4500 0044 3ced 4000 0111 afae ac11 0001 E..
D<.@.....
23 » 0x0010: e000 00fb 14e9 14e9 0030 8d4f 0000 0000 ....
.....0.0....
```

```
1 00:00:00.000000 IP 172.17.0.1.44220->239.255.255.250.1900:
UDP, length 172
2 » 0x0000: 4500 00c8 4b36 4000 0111 91e2 ac11 0001 E..
.K6@.....
3 » 0x0010: efff fffa acbc 076c 00b4 9cd2 4d2d 5345 ....
....1...M-SE
```

PDF

test1.pdf vs.
test2.pdf

852 B

pdftotext {} -

86.0 B

Offset 1, 3 lines modified

Offset 1, 3 lines modified

1 Hello World!

1 Hello Sick Sad World!

2 \xc

2 \xc

pdftk {} output - uncompress

748 B

Offset 11, 23 lines modified

Offset 11, 23 lines modified

11 /Kids [3 0 R]

11 /Kids [3 0 R]

12 /Type /Pages

12 /Type /Pages

13 /Count 1

13 /Count 1

14 >>

14 >>

15 endobj

15 endobj

16 4 0 obj

16 4 0 obj

17 <<

17 <<

18 /Length 85

18 /Length 109

19 >>

19 >>

20 stream

20 stream

21 q

21 q

22 BT

22 BT

23 36.0 747.384 Td

23 36.0 747.384 Td

24 /F1.0 12 Tf

24 /F1.0 12 Tf

25 [<48656c6c6f2057> 30 <6f72> -15 <6c6421>] TJ

25 [<48656c6c6f20536963> 20 <6b205361642057> 30 <6f72> -15 <6c6421>] TJ

26 ET

26 ET

27 Q

27 Q

28 endstream

28 endstream

29 endobj

29 endobj

30 3 0 obj

30 3 0 obj

Offset 61, 21 lines modified

Offset 61, 21 lines modified

61 /Producer <feff0050007200610077006e>

61 /Producer <feff0050007200610077006e>

62 >>

62 >>

63 endobj xref

63 endobj xref

64 0 7

64 0 7

65 0000000000 65535 f

65 0000000000 65535 f

66 0000000015 00000 n

66 0000000015 00000 n

67 0000000066 00000 n

67 0000000066 00000 n

68 0000000263 00000 n

68 0000000288 00000 n

69 0000000125 00000 n

69 0000000125 00000 n

70 0000000462 00000 n

70 0000000487 00000 n

71 0000000561 00000 n

71 0000000586 00000 n

72 trailer

72 trailer

73 <<

73 <<

74 /Info 6 0 R

74 /Info 6 0 R

XML documents

test1.xml vs.
test2.xml

453 B

test1.xml vs.
test2.xml

435 B

Offset 1, 9 lines modified

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <note>
3   ..<style id="night-mode-pro-style" type="text/css"/>
4   ..<link id="night-mode-pro-link" rel="stylesheet" type="text/
css"/>
5   ..<to>Tove</to>
6   ..<from>Jani</from>
7   ..<heading>Reminder</heading>
8   ..<body>Don't forget me this weekend!</body>
9 </note>
```

Offset 1, 9 lines modified

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <note>
3   ..<style id="night-mode-pro-style" type="text/css"/>
4   ..<link id="night-mode-pro-link" rel="stylesheet" type="text/
css"/>
5   ..<to>Jani</to>
6   ..<from>Toni</from>
7   ..<heading>Re: Reminder</heading>
8   ..<body>Pick me up on 5!</body>
9 </note>
```

Using diffoscope for QA

Just see changes you expect

Seeing "no" changes

Security releases

```
@@ -119,15 +119,15 @@
```

```
    Buffer buf;  
    Packet packet;
```

```
    SocketFactory socket_factory=null;
```

```
    static final int buffer_margin = 32 + // maximum padding length  
-                                     20 + // maximum mac length  
+                                     64 + // maximum mac length  
                                     32; // margin for deflater; deflater may inflate data
```

```
    private java.util.Hashtable config=null;
```

Security "releases"

Index of /firmware/netgear

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory		-	
 GS7xxTP_V5.2.0.9.ros	2013-02-18 10:20	3.7M	
 GS105E_v1.02.04.HEX	2013-02-03 21:25	2.4M	
 GS108EV2_V1.00.12.bin	2013-06-11 17:14	256K	
 GS108Tv2_GS110TP_V5.4.2.9.stk	2013-09-02 22:48	3.9M	
 GS110T_v5.4.0.6.stk	2012-10-12 22:49	4.0M	
 gsm72xxv2-V8.0.1.36.stk	2012-05-12 00:49	7.6M	

Getting started

try.diffoscope.org

Fork me on GitHub



Try diffoscope now...

diffoscope is a tool to get to the bottom of what makes files or directories different. It recursively unpacks archives of many kinds and transforms various binary formats into more human readable forms to compare them.

File #1 (max: 60MB)

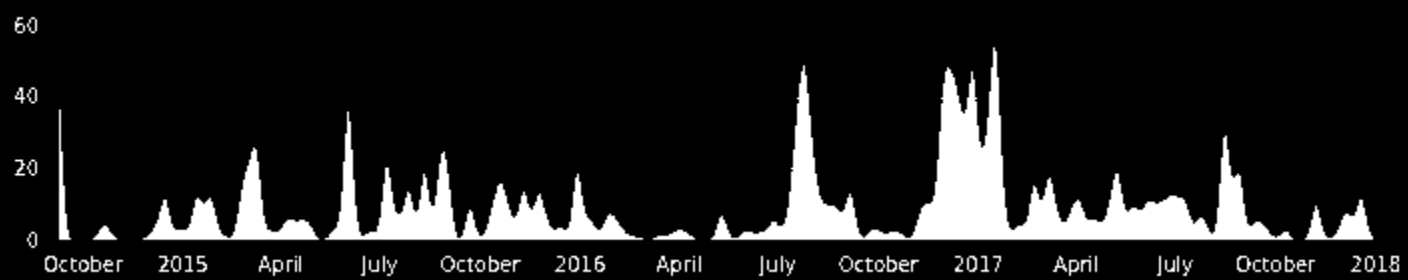
No file selected

File #2 (max: 60MB)

No file selected

```
$ pip install trydiffoscope # or: sudo apt-get install trydiffoscope
$ trydiffoscope --webbrowser /path/to/file1 /path/to/file2
```

Current status



nose2

Test Details

notes

Test history

Filter by: amd64 i386
arm64 armhf

Suite and Architecture

amd64

0.6.5-2 in stretch

0.6.5-2 in buster

0.7.3-1 in unstable

i386

0.6.5-2 in stretch

0.6.5-2 in buster

0.6.5-2 in unstable

unreproducible

at 2017-12-03 21:47 UTC

differences (txt)

buildinfo

rbuild (22KB) build2

(19KB) diff

```

10 quiet]
11 [\-\-log\-\-level LOG_LEVEL] [\-\-coverage PATH]
12 [\-\-coverage\-\-report TYPE] [\-\-coverage\-\-config FILE] [\-\-
13 C] [\-\-B] [\-\-D]
14 [\-\-F] [\-\-h]
15 [testNames [testNames...]]
16 .SS "positional arguments:"
17 .IP
18 testNames
19 .SS "optional arguments:"
20 .TP
21 \fB\-\-s\-\-fR START_DIR, \fB\-\-start\-\-dir\-\-fR START_DIR
22 Offset 62, 15 lines modified
23 .TP
24 \fB\-\-coverage\-\-config\-\-fR FILE
25 Config file for coverage, default: .coveragerc
26 .TP
27 \fB\-\-C\-\-fR, \fB\-\-with\-\-coverage\-\-fR
28 Turn on coverage reporting
29 .TP
30 \fB\-\-B\-\-fR, \fB\-\-output\-\-buffer\-\-fR
31 Enable output buffer
32 .TP
33 \fB\-\-D\-\-fR, \fB\-\-debugger\-\-fR
34 Enter pdb on test fail or error
35 .TP
36 \fB\-\-F\-\-fR, \fB\-\-fail\-\-fast\-\-fR
37 Stop the test run after the first error or failure
38
39 quiet]
40 [\-\-log\-\-level LOG_LEVEL] [\-\-coverage PATH]
41 [\-\-coverage\-\-report TYPE] [\-\-coverage\-\-config FILE] [\-\-
42 C] [\-\-B] [\-\-D]
43 [\-\-F] [\-\-h]
44 [testNames [testNames...]]
45 .SS "positional arguments:"
46 .IP
47 testNames
48 .SS "optional arguments:"
49 .TP
50 \fB\-\-s\-\-fR START_DIR, \fB\-\-start\-\-dir\-\-fR START_DIR
51 Offset 62, 15 lines modified
52 .TP
53 \fB\-\-coverage\-\-config\-\-fR FILE
54 Config file for coverage, default: .coveragerc
55 .TP
56 \fB\-\-C\-\-fR, \fB\-\-with\-\-coverage\-\-fR
57 Turn on coverage reporting
58 .TP
59 \fB\-\-B\-\-fR, \fB\-\-fail\-\-fast\-\-fR
60 Stop the test run after the first error or failure
61
62 \fB\-\-D\-\-fR, \fB\-\-debugger\-\-fR
63 Enter pdb on test fail or error
64 .TP
65 \fB\-\-F\-\-fR, \fB\-\-output\-\-buffer\-\-fR
66 Enable output buffer

```

./usr/share/man/man1/nose2-3.5.1.gz

1.25 KB

nose2-3.5.1

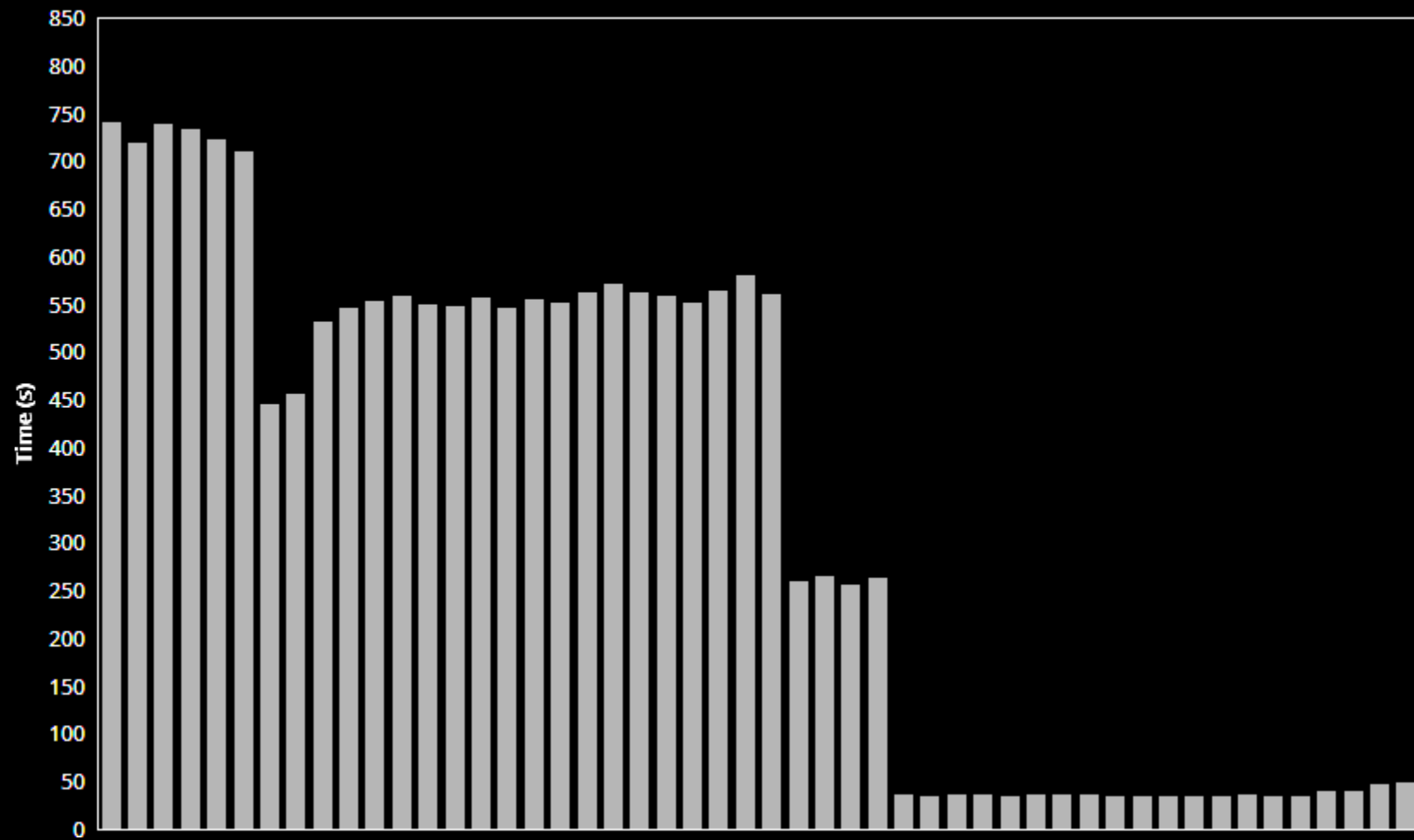
1.19 KB

```

4 nose2-3 \-\- nose2-3
5 .SH DESCRIPTION
6 usage: nose2 [\-\-s START_DIR] [\-\-t TOP_LEVEL_DIRECTORY] [\-\-
7 config [CONFIG]]
8 .IP
9 [\-\-no\-\-user\-\-config] [\-\-no\-\-plugins] [\-\-plugin PLUGINS]
10 [\-\-exclude\-\-plugin EXCLUDE_PLUGINS] [\-\-verbose] [\-\-
11 quiet]
12 [\-\-log\-\-level LOG_LEVEL] [\-\-coverage PATH]
13 [\-\-coverage\-\-report TYPE] [\-\-coverage\-\-config FILE] [\-\-
14 C] [\-\-B] [\-\-D]
15 [\-\-F] [\-\-h]
16 [testNames [testNames...]]
17 .SS "positional arguments:"
18 .IP
19 testNames
20
21 nose2-3 \-\- nose2-3
22 .SH DESCRIPTION
23 usage: nose2 [\-\-s START_DIR] [\-\-t TOP_LEVEL_DIRECTORY] [\-\-
24 config [CONFIG]]
25 .IP
26 [\-\-no\-\-user\-\-config] [\-\-no\-\-plugins] [\-\-plugin PLUGINS]
27 [\-\-exclude\-\-plugin EXCLUDE_PLUGINS] [\-\-verbose] [\-\-
28 quiet]
29 [\-\-log\-\-level LOG_LEVEL] [\-\-coverage PATH]
30 [\-\-coverage\-\-report TYPE] [\-\-coverage\-\-config FILE] [\-\-
31 C] [\-\-B] [\-\-D]
32 [\-\-F] [\-\-h]
33 [testNames [testNames...]]
34 .SS "positional arguments:"
35 .IP
36 testNames

```

Comparing two NetBSD release tarballs



Parallel processing

Multiple previous attempts...

... Juliana Oliveira working on this now

diffoscope.org

Tack!



@lolamby
lamby@debian.org

diffoscope.org
chris-lamb.co.uk



@lolamby
lamby@debian.org

diffoscope.org
chris-lamb.co.uk