A Community Take on the License Compliance Industry

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MIT
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What is compliance?

"respect the terms of the applicable FOSS license"

Definition (Compliance)

Noun:

1. acting according to certain accepted standards
2. disposition or tendency to yield to the will of others
3. the act of submitting;
   usually surrendering power to another

— WordNet 3.0 (2006)

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Definition (Compliance)

Noun:

1. acting according to certain accepted standards → by whom?
2. disposition or tendency to yield to the will of others → who?
3. the act of submitting;
   usually surrendering power to another → to whom?

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Compliance ← seen from “the FOSS community”

Who:

- activists
- developers
- (copyright holders)

Goals:

- pursue a political strategy (e.g., copyleft)
- make sure everyone “play by the rules” (≈ “accepted standards”)
  - the legal soundness of rules is barely relevant here
- (defend an investment)

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Compliance ← seen from “the software industry”

Who:

- for profit IT vendors who ship FOSS
- in context:
  - links in a long software supply chain
  - market pressure
- FOSS competence: very variable
- commitment to FOSS ideals: free riders ⟷ contributors

Goals:

- minimize legal risks
- minimize compliance cost
- (reassure the next link in the supply chain)

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The compliance industry

Customers:

- “the software industry”

Products:

- code scanners
  - provenance tracking
  - linting for common “IP” issues
  - adherence to *ad-hoc* “IP” policy
- Bill Of Material (BOM) reporters
  - long-term software maintenance
- software qualification (e.g., security flaws, quality metrics, etc.)

By-products:

- reports on the state of the FOSS ecosystem

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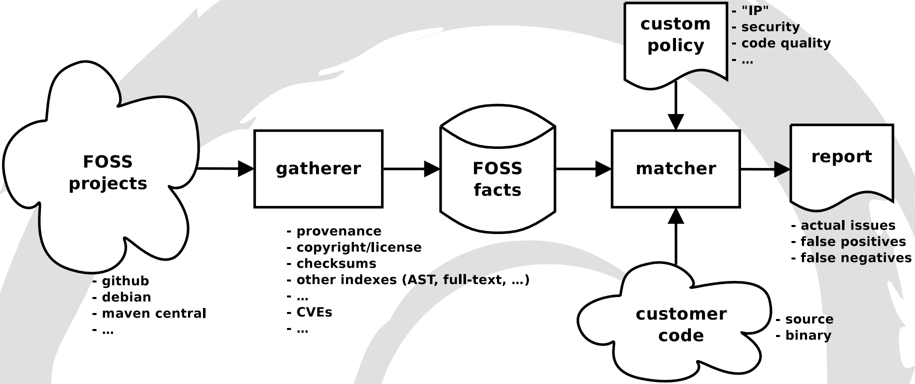
The compliance toolchain



FOSS projects

- github
- debian
- maven central
- …

gatherer

- provenance
- copyright/license
- checksums
- other indexes (AST, full-text, …)
- …
- CVEs
- …

FOSS facts

custom policy

- "IP"
- security
- code quality
- …

matcher

customer code

- source
- binary

report

- actual issues
- false positives
- false negatives

A note about copyright-related facts:

✗ ~~*foo.c is under GPL3+*~~

✓ *foo.c, when we last saw it (UNIX timestamp 1454060276) at http://git.example.com/foo/, had SHA1* f1d2df2... *and copyright header “foo is free software [. . .] under the terms of the GNU General Public License, version 3 or any later version”*

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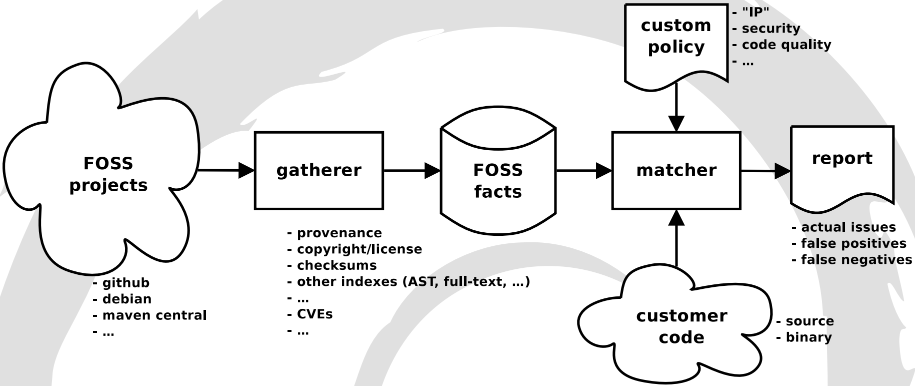

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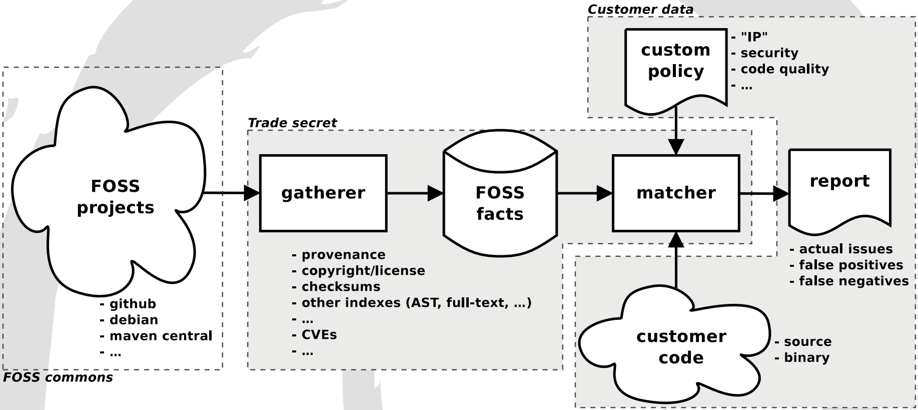
The compliance toolchain . . . and the commons



A community critique of today's compliance industry

- the tragedy of the ethical software entrepreneur
  - non-free tooling
  - non-free data
- no (or poor) reproducibility
- who controls the ~~controllers~~ policy makers?
- the cultural impact of by-products

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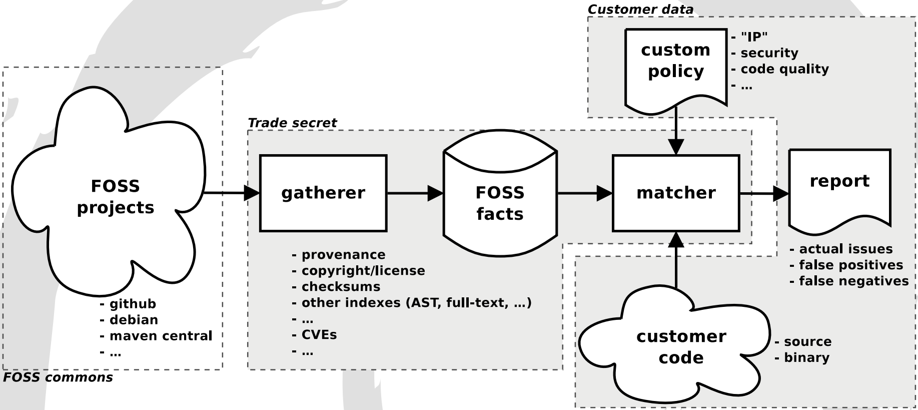
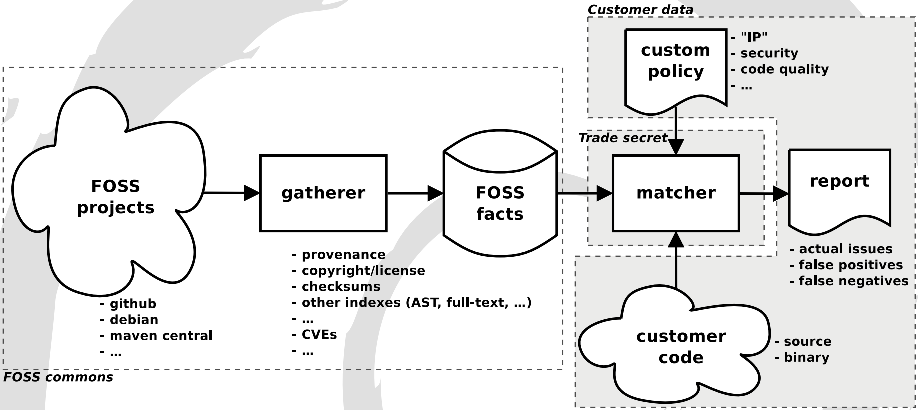
The compliance toolchain — today



The compliance toolchain — tomorrow?



Benefits

for “the FOSS community”:

- free tools and data (e.g., to point allies to)
- independent analyzability of the state of the ecosystem

for “the software industry”:

- reduced risks of vendor lock-in
- more disintermediation, FOSS facts from the source

for the compliance industry:

- community buy in
- effort sharing → reduced costs

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A small scale example: Debsources

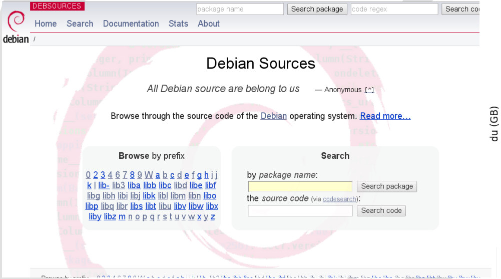
1. an infrastructure to publish Debian source code on the Web
2. a notable instance indexing *all* Debian source code to date: `http://sources.debian.net`

For developers:

- browse/search source code
- syntax highlighting
- pinpoint code lines, annotate

For data miners:

- 20+ years of FOSS history
- live change monitoring
- source code indexing



Debian Sources

All Debian source are belong to us — Anonymous [^]

Browse through the source code of the Debian operating system. Read more…

Browse by prefix

0 2 3 4 6 7 8 9 W a b c d e f g h i j k l lib- lib3 liba libb libc libd libe libf libg libh libi libj libk libl libm libn libo libp libq libr libs libt libu libv libw libx liby libz m n o p q r s t u v w x y z

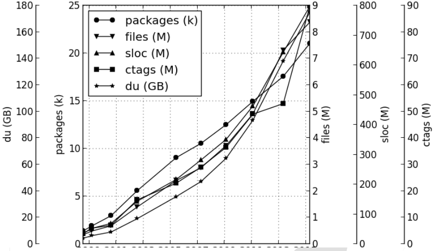
Search

by *package name*:

Search package

the *source code* (via codesearch):

Search code



Debsources — coverage

Covered releases:

- all stable releases from Debian Hamm (1997) to Jessie (2015)
- LTS security updates
- development releases: testing, unstable, experimental, . . .

Update frequency: 4 times a day (at each Debian archive change)

Overall content: (Oct 2015)

- 90 K source packages
- 790 GB of source code
- 45 M source code files
  - 18 M *distinct* SHA256
- 4.3 B lines of code
- 485 M developer-defined symbols (ctags)

more stats at
`http://sources.debian.net/stats/`

Debsources — copyright & license information

Data providers of copyright & license information:

- debian/copyright files
- scans of the Debsources corpus[1]
  - FOSSology[2]
  - Ninka[3]

Data consumers: public, well-documented API

[1] joint work with Daniel M. German and Matthieu Caneill, upcoming publication

[2] http://fossology.org

[3] http://ninka.turingmachine.org

Use case #1: detect bit-identical reuse

Example

```
http://sources.debian.net/api/sha256/?checksum=
ae8e672aaa16bbdf734eabefaf2ee5987013d726868f776de1728f6a36a0ae2d
```

```
{ "count": 3,
  "sha256":
    "ae8e672aaa16bbdf734eabefaf2ee5987013d726868f776de1728f6a36a0ae2d",
  "results": [
    { "path": "coreutils/ls.c",
      "version": "1:1.22.0-12",
      "package": "busybox" },
    { "path": "coreutils/ls.c",
      "version": "1:1.22.0-15",
      "package": "busybox" },
    { "path": "coreutils/ls.c",
      "version": "1:1.22.0-9+deb8u1",
      "package": "busybox" } ] }
```

It is now trivial to develop a source code scanner that uses Debsources as backend to detect bit-identical reuse of source code files present in Debian.

Use case #2: detect reuse with modification

Debsources can support simple fingerprinting techniques:

- ctags searches — *"show me the files that define this function/ variable/ class/ etc."*

Example

`http://sources.debian.net/api/ctag/?ctag=pcre_compile`

```
{ "count": 400,
  "ctag": "pcre_compile",
  "results": [
    { "path": "glib/pcre/pcre_compile.c", "line": 7565,
      "package": "glib2.0", "version": "2.33.12+really2.32.4-5"
    },
    { "path": "pcre_compile.c", "line": 7563,
      "package": "pcre3", "version": "1:8.30-5"
    },
    { "path": "libasync/pcre.c", "line": 4097,
      "package": "mailavenger", "version": "0.8.3rc1-1"
    }, [...] ] }
```

- *ad hoc* regexp searches (powered by codesearch.debian.net)

Use case #3: SPDX generation

When instantiated to a specific source package, machine-readable debian/copyright files can be used to automatically generate SPDX.

Example (SPDX export)

```
http://sourcesdev.debian.net/copyright/license/gnubg/1.04.000-1/
http://sourcesdev.debian.net/copyright/spdx/gnubg/1.04.000-1/
```

```
SPDXVersion: SPDX-2.0
DataLicense:CC0-1.0
DocumentName: GNU Backgammon
FileName: bearoffgammon.h
FileChecksum: SHA256: 4e87bfe929021d710b4046b570b2042489c2cd7cdabc9ea46572b1
LicenseConcluded: GPL-3+
FileCopyrightText: <text>1984, 1989-1990, 1995-1997, 1999-2011
    Free Software Foundation, Inc.
  1996 Claes Thornberg (claest@it.kth.se)
  1998-1999 Mark Spencer <markster@marko.net>
  2000 Jonathan Blandford
[...]
```

Credits: Orestis Ioannou, GSoC 2015. Status: beta, dev. preview

Parting thoughts

A benchmark for the compliance industry:

- exhaustivity → hopeless without a collaborative effort!
- quality → composes well; industry-private + open DBs?
- granularity → lot to do, great competition playground!

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- the compliance industry has potential to help well-meaning actors
- but to do so properly we need free tools and data
- an open compliance DB might benefit everybody

Thanks!

Questions?

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about the slides:
available at https://upsilon.cc/~zack/talks/2016/2016-03-19-libreplanet-compliance.pdf