

Open Source Software

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COSS C01

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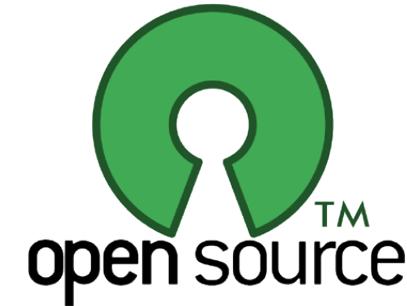
Agenda

1. Legal definition
2. A (very) short history
3. Open source licenses
4. Open source license compliance
5. Open source governance
6. Problems with using open source
7. Open source control mechanisms

1. Legal Definition

Legal Definition of Free and Open Source Software

- Software is **free software** [1] if
 - The user is granted rights to
 - Use, study, modify, and distribute the software
 - Free of charge and other restrictions
- Managed by the Free Software Foundation
- Software is **open source software** [2] if
 - The user is granted rights to
 - Use, modify, and distribute the software
 - Free of charge and other restrictions
- Managed by the Open Source Initiative



- For all practical purposes, free and open source software are the same

[1] See <https://www.gnu.org/philosophy/free-sw.html.en>

[2] See <https://opensource.org/osd>

Open Source Terminology

- Open source software
 - Is software owned by a large number of contributors
 - Who all individually own the copyright to their contributions
- Open source (software) project [1]
 - Is an open source software + associated community that
 - Has no formal organizational backing but rather relies on individual people
- Open source (software) product
 - Is a commercial product utilizing an open source strategy

[1] Not a project in a traditional sense; no end date set

Example Open Source Software



debian

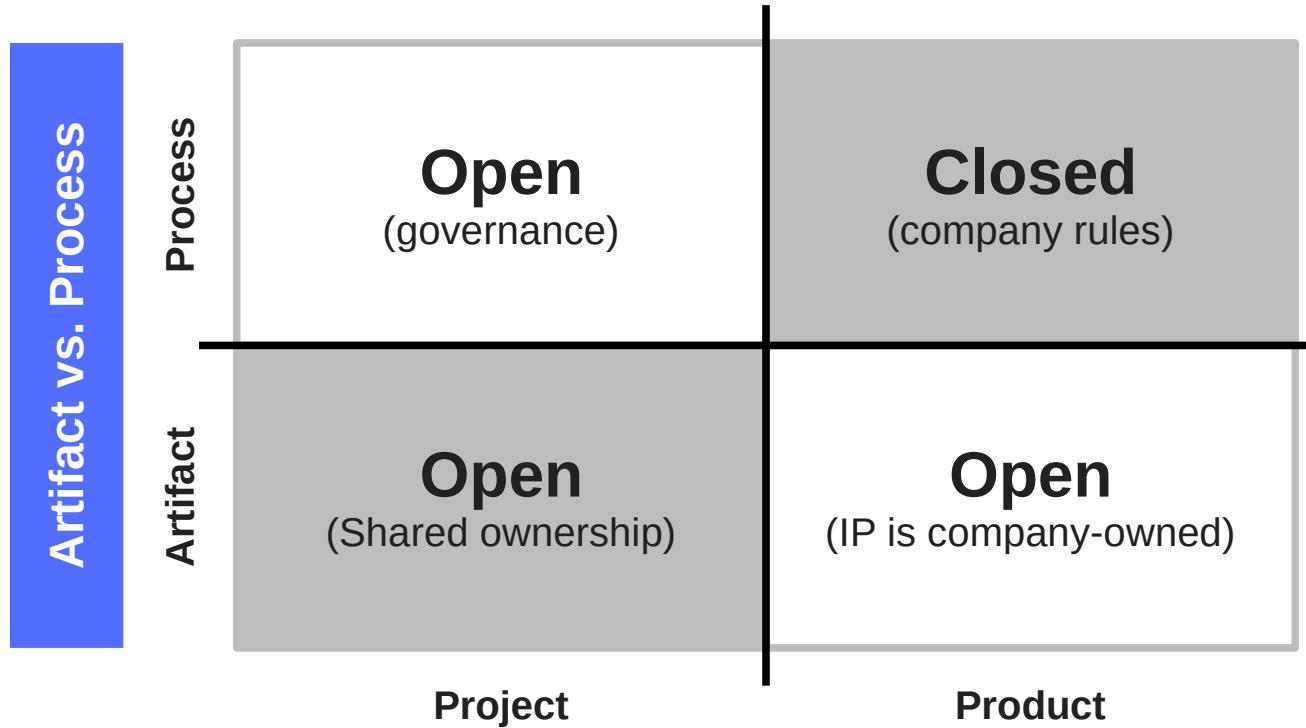


2. A (Very) Short History

Short History of Open Source

- 1960-1979: Not-born-yet (the first era) [LT02]
 - Little or no recognition of software as intellectual property
 - Free sharing of source code, allowing for rapid diffusion and innovation
- 1980-1989: Philosophy (the second era)
 - Founding of the Free Software Foundation by Richard Stallman in 1985
 - Invention of GNU public license for “freeing software”
- 1990-1999: Pragmatism (the third era)
 - Founding of Open Source Initiative in 1998, increased pragmatism
 - Start of growth in number of projects as well as open source licenses
- 2000-2009: Professionalization (the fourth era)
 - Professionalization of open source, away from pure volunteerism
 - Increased focus on commercialization
- 2010-today: Mainstream (the current era)
 - Continued strong growth, simplified access, improved tooling
 - Open source as an on-ramp to the cloud

Community vs. Commercial Open Source 1 / 2



Project vs. Product

Community vs. Commercial Open Source 2 / 2

- Community open source
 - Traditional open source projects (e.g. GIMP)
 - Developer-led projects / foundations (e.g. Jakarta / Eclipse)
 - User-led projects / foundations (e.g. Kuali)
- Commercial open source
 - Single-vendor open source firms (e.g. MongoDB)
 - Open source distributor firms (e.g. SUSE)
 - Service and support firms (e.g. Cygnus Solutions)

3. Open Source Licenses

Anatomy of Open Source Licenses

1. Copyright notice

- The name of the owner and when this work was created and updated

2. Rights grant

- The rights granted to a user if they fulfill obligations matching the use-case

3. Obligations to fulfill

- A set of obligations (requirements) before the rights grant becomes valid

4. Prohibitions (none in the MIT license)

- A set of things the user is prohibited from

5. Disclaimer

- The usual disclaimer of warranties, guarantees, etc.

The MIT License (Template)

1

Copyright <YEAR> <COPYRIGHT HOLDER>

2

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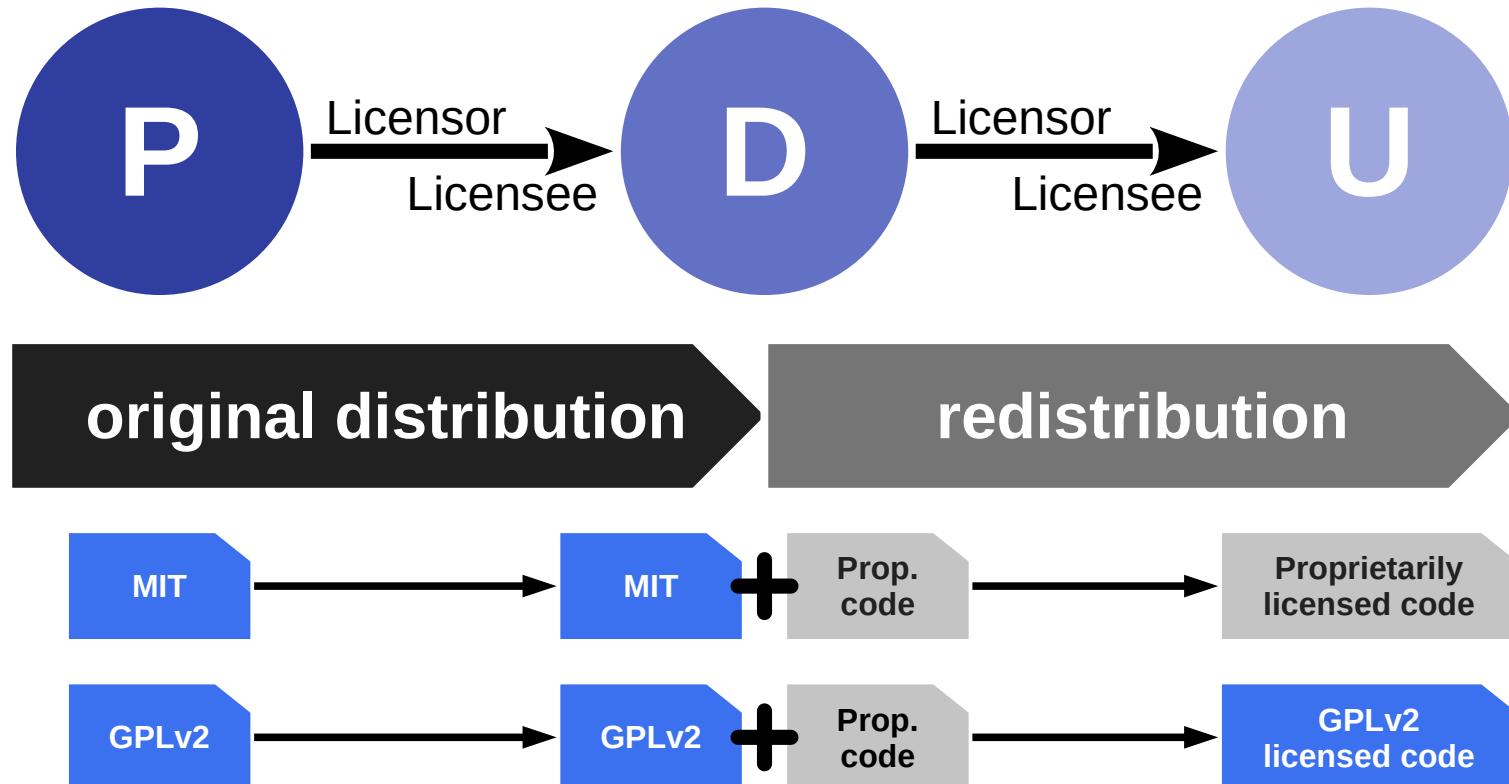
The Main Use-Cases of Open Source Software

- **In-house use** (everything where you do not pass on code)
 - Personal use
 - Demos to customers
 - Software development tools
- **Distribution** (where you pass on binary or source code)

The Most Common Obligations for the Distribution Use-Case

- Legal notices
 - Provide attribution
 - Provide license text
 - Provide disclaimers
- Copyleft
 - Propagate license

Distribution and Rights Propagation



P = Original open source programmer
D = Distributor (e.g. vendor)
U = User (e.g. customer)

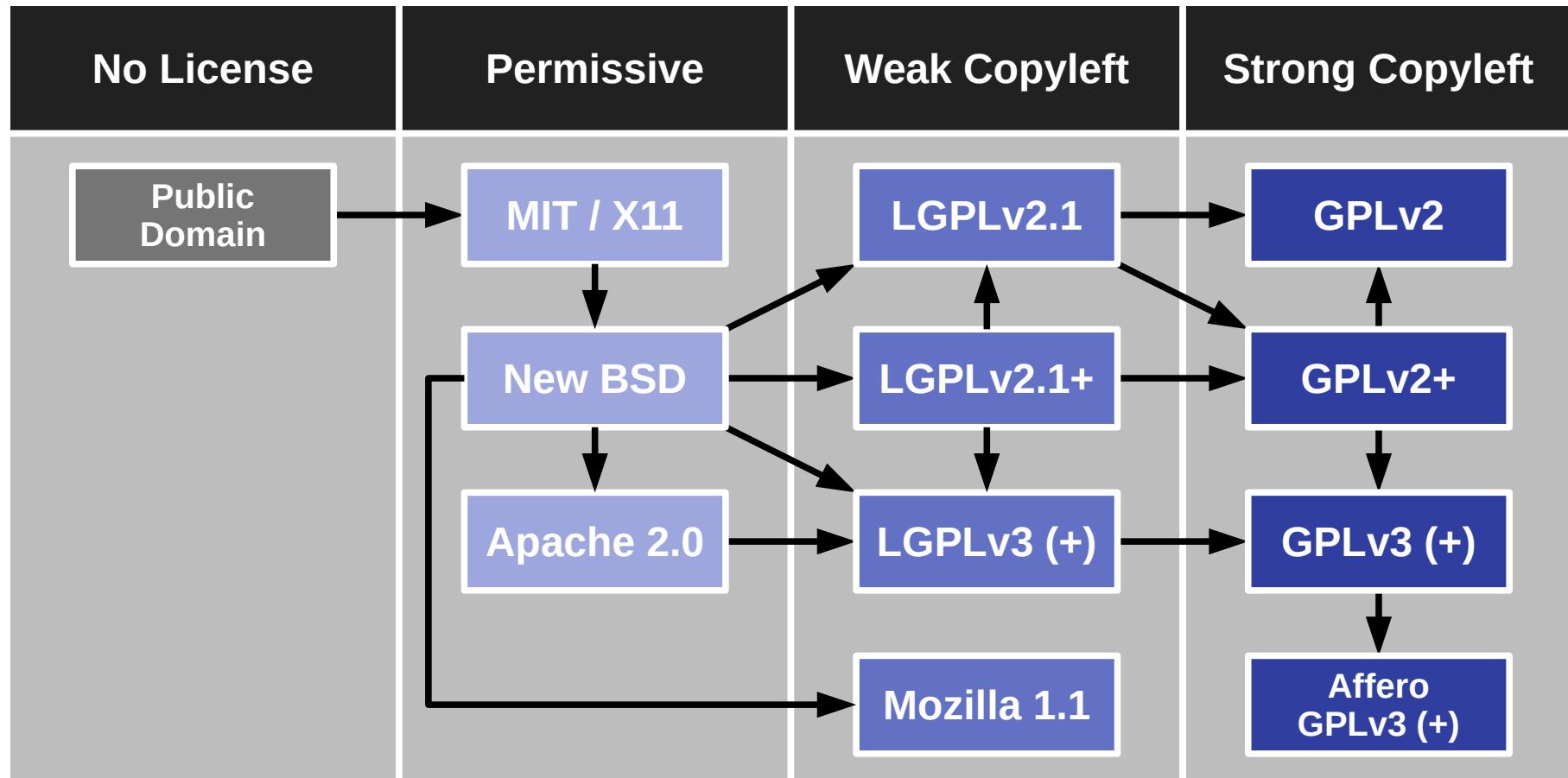
Types of Licenses by Copyleft Obligation

- Permissive licenses
 - Do not include a copyleft obligation
 - Examples: MIT, BSD-2-Clause, ...
- Weak copyleft licenses
 - Limited use of copyleft obligation
 - Examples: EPL-1.0, LGPL-2.1-or-later, ...
- Strong copyleft licenses
 - Attempted maximum applicability of copyleft obligation
 - Examples: GPL-2.0-only, AGPL-3.0-or-later, ...

Changes in License Popularity

2009			2019		
#	Name	Market Share	#	Name	Market Share
1	GNU General Public License (GPL) 2.0	52.20%	1	MIT License	32%
2	GNU Lesser General Public License (LGPL) 2.1	9.84%	2	GNU General Public License (GPL) 2.0	18%
3	Artistic License (Perl)	9.01%	3	Apache License 2.0	14%
4	BSD License 2.0	6.27%	4	GNU General Public License (GPL) 3.0	7%
5	GNU General Public License (GPL) 3.0	4.15%	5	BSD License 2.0 (3-clause, New or Revised)	6%
6	Code Project Open 1.02 License	3.59%	6	ISC License	5%
7	Apache License 2.0	3.58%	7	Artistic License (Perl)	4%
8	MIT License	3.32%	8	GNU Lesser General Public License (LGPL) 2.1	4%
9	Mozilla Public License (MPL) 1.1	1.25%	9	GNU Lesser General Public License (LGPL) 3.0	2%
10	Common Public License (CPL)	0.64%	10	Eclipse Public License (EPL)	1%
11	zlib/libpng License	0.51%	11	Microsoft Public License	1%
12	Academic Free License	0.43%	12	Simplified BSD License (BSD)	1%
13	Eclipse Public License (EPL)	0.40%	13	Code Project Open License 1.02	1%
14	Open Software License (OSL)	0.37%	14	Mozilla Public License (MPL) 1.1	<1%
15	GNU Lesser General Public License (LGPL) 3.0	0.37%	15	GNU Affero General Public License 3.0 or later	<1%
16	Mozilla Public License (MPL) 1.0	0.30%	16	Common Development and Distribution License	<1%
17	PHP License Version 3.0	0.28%	17	Do What the F**k You Want To Public License	<1%
18	Ruby License	0.26%	18	Microsoft Reciprocal License	<1%
19	Sun Berkeley License (BSD 2+)	0.18%	19	Sun GPL with Classpath Exception 2.0	<1%
20	Common Development and Distribution License	0.16%	20	zlib/libpng License	<1%

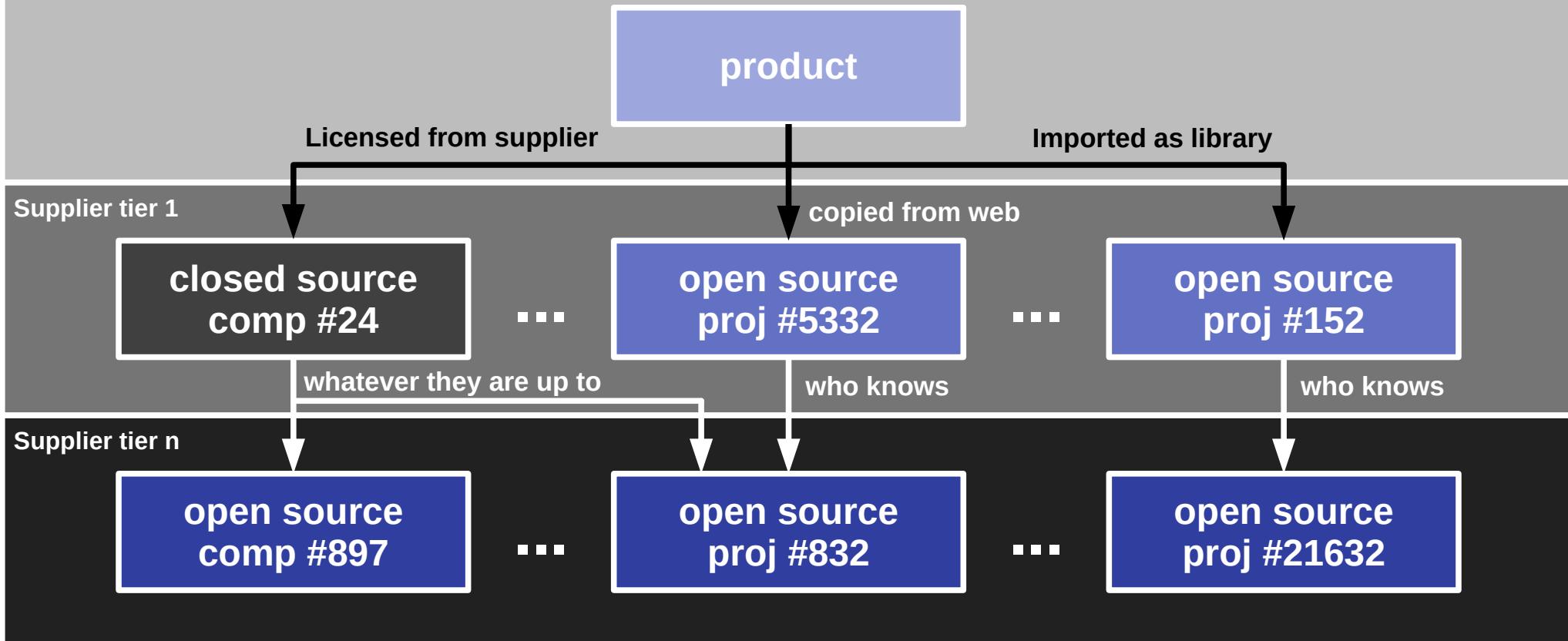
Open Source License Categories and Families



4. Open Source License Compliance

The Software Supply Chain

Software vendor





[1] <http://www.embedded.it/?q=content/daimler-mercedes-benz-and-open-source-software>

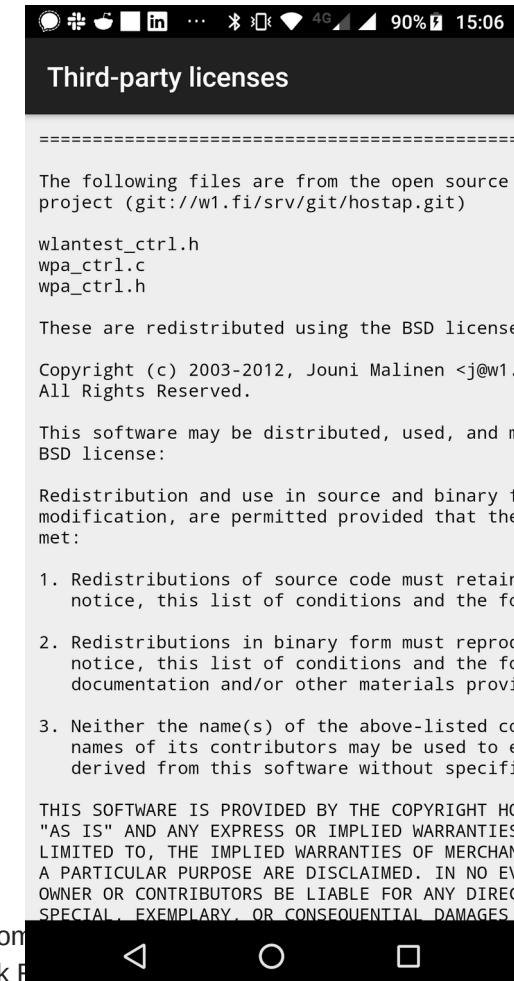
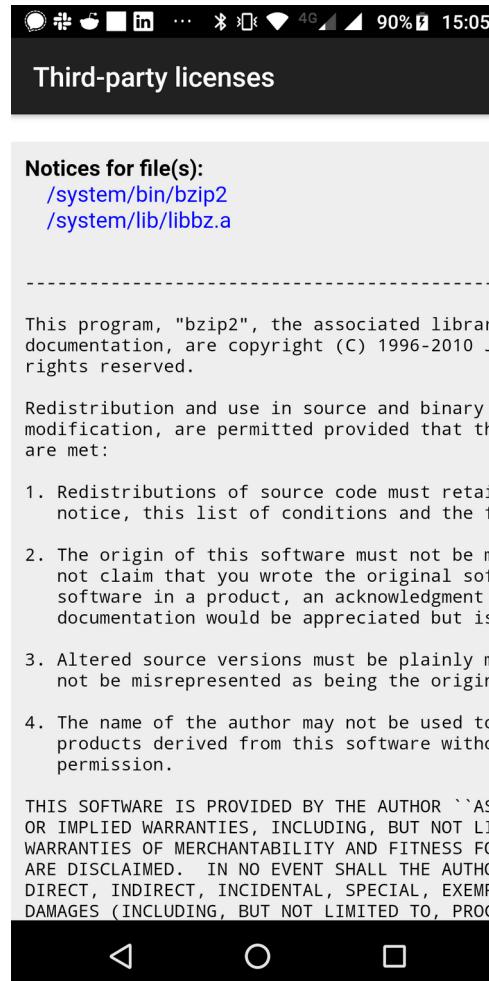
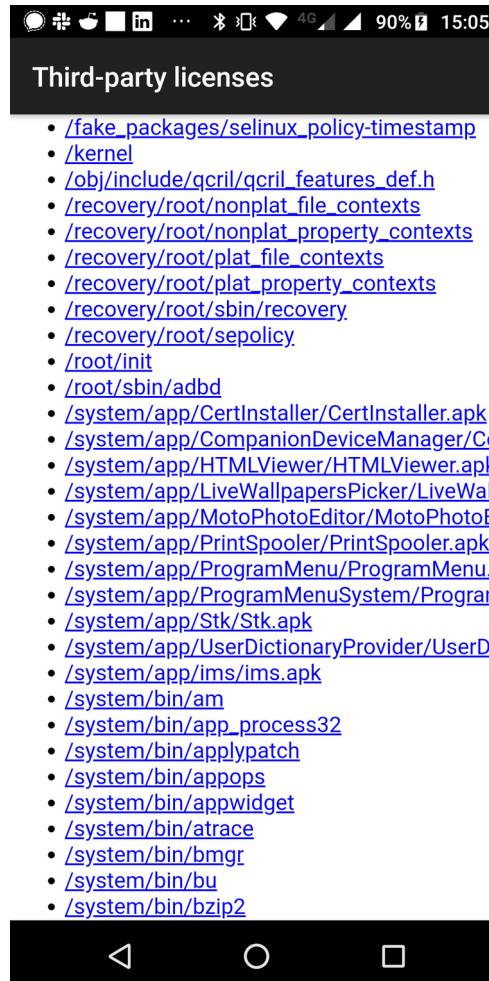
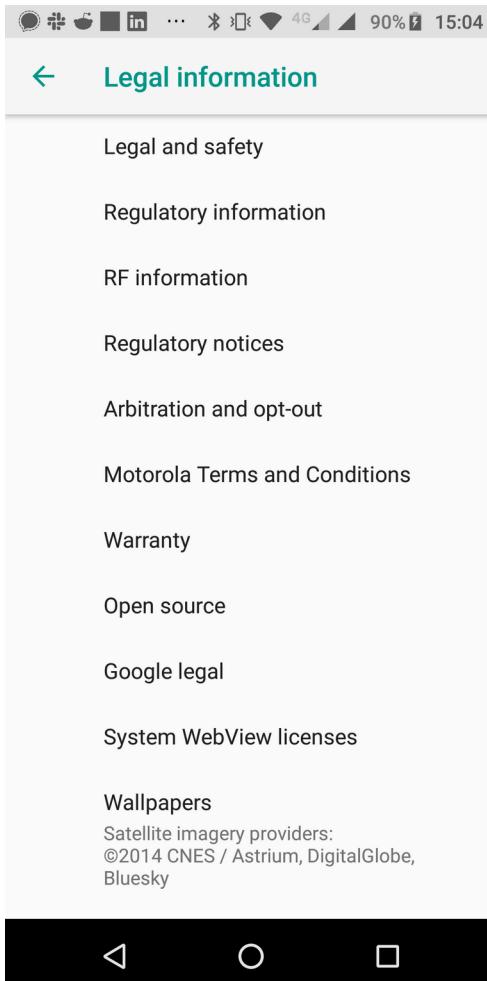
[2] https://moba.i.daimler.com/bai-cars/ba/foss/content/en/licence_agreement.html

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Android's Legal Notices (Distribution Use-Case)



License Incompliance Discovery Risk

Consumer >> Enterprise

Low price >> High price

Embedded >> Cloud computing

Copyleft license >> Permissive license

5. Open Source Governance

Open Source Governance

- Governance
 - Is the set of processes, practices, institutions, and roles used to lead and manage a social system
- **Open source governance in companies**
 - Is the governance of using open source software in a company, usually in products
 - Initial selection of components
 - Management of dependency
 - Eventual replacement
 - Usually the mandate of an **open source program office**
- Example governance for universities
 - University of California
 - <https://security.ucop.edu/resources/open-source-software-licensing.html>
 - My research group
 - <https://goo.gl/2fm4cx>

Open Source Don'ts (Example Rules 1 / 3)

- Do not copy open source code and strip the license
- Do not copy open source code of undesired licenses
 - Do not copy code without a license (it is proprietary code)
 - Do not copy copyleft-licensed code into your codebase
 - Do not copy from Stack Overflow (code is copyleft-licensed)
 - Do not copy and paste from open source projects
- Do not include copyleft-licensed libraries into your project
- Do not trust the license that an open source component is labeled with
- Do not combine software components with contradicting licenses

Open Source Dos (Example Rules 2 / 3)

- Only use permissively licensed open source components
- Prefer governed sources over ungoverned ones like Github
- Maintain a bill-of-materials for the creation of legal notices

Projects, Licenses, and Sources (Example Rules 3 / 3)

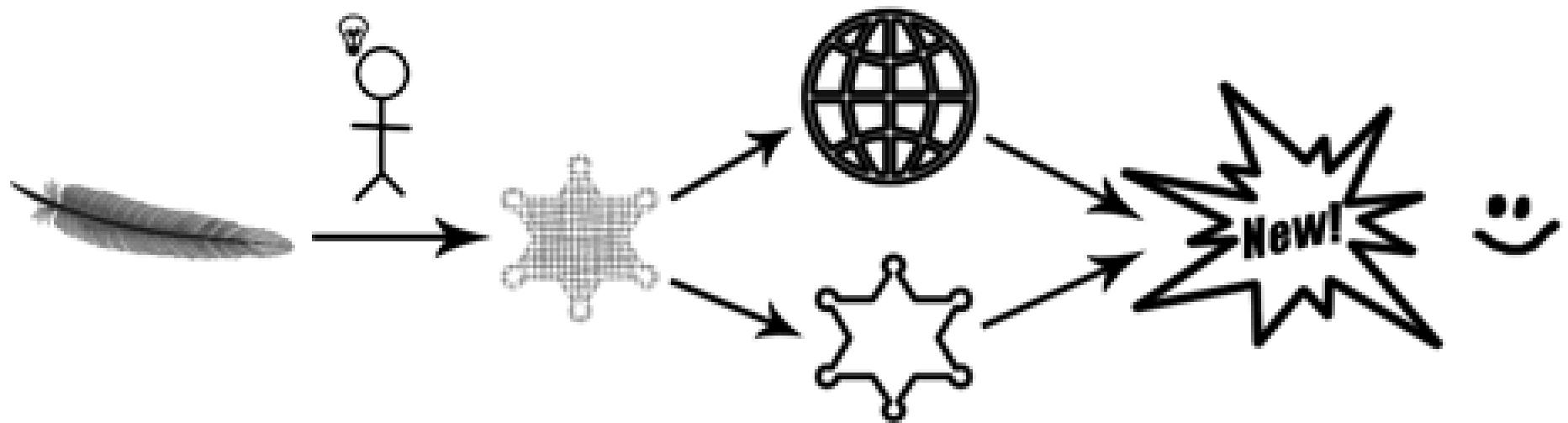
	Allow list	Must-Ask List	Deny List
Projects	<ul style="list-style-type: none">PostgreSQL	<ul style="list-style-type: none">zlib	
Licenses	<ul style="list-style-type: none">MITApache 2.0All BSD variants	<ul style="list-style-type: none">EPL 1.1, EPL 2.0	<ul style="list-style-type: none">Any GPL license
Sources	<ul style="list-style-type: none">ASF websiteGoogle Github repoFB Github repo	<ul style="list-style-type: none">Linux FoundationEclipse Foundation	<ul style="list-style-type: none">Stack OverflowRandom website

6. Problems with Using Open Source

Problems with Using Open Source Software

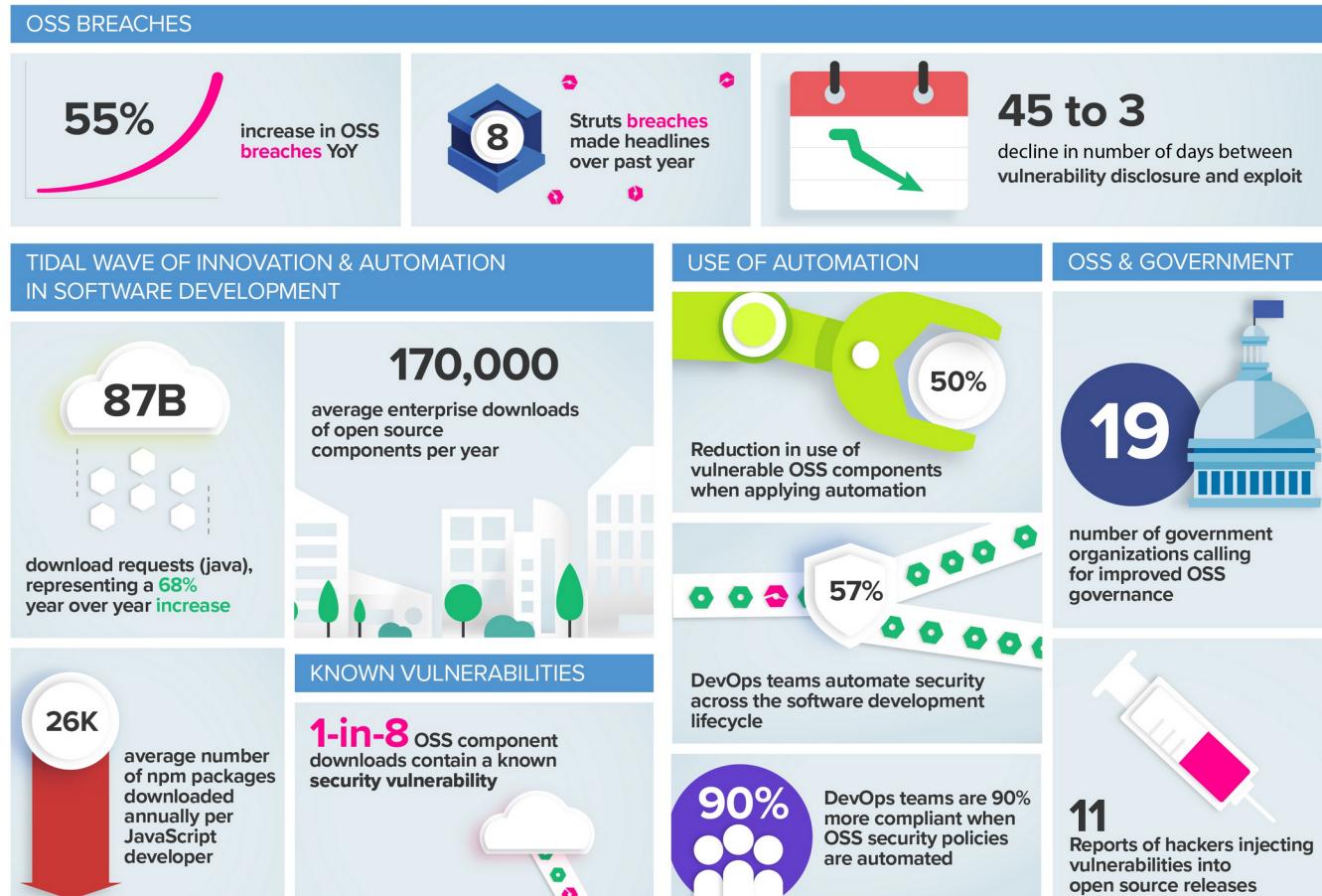
- When using open source software
 - Ensuring clean intellectual property
 - Managing security vulnerabilities
 - Managing the technical dependency
- When building a business on top
 - Ensuring access to source code
 - Ensuring access to trademarks
 - Ensuring access to patents

Ensuring Clean Intellectual Property [1]



[1] See https://www.eclipse.org/projects/dev_process/ip-process-in-cartoons.php

Managing Security Vulnerabilities [1]

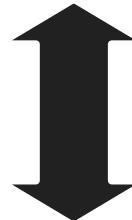


[1] See <https://blog.sonatype.com/2018-state-of-the-software-supply-chain-report>

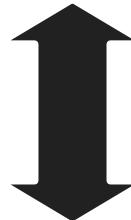
Ensuring Access to Intellectual Property



Nagios®



iCINGA



Nextcloud

7. Open Source Control Mechanisms

Control Points and Steering Mechanisms [R11]

1. Intellectual property control

1. Copyright control
2. Patent ownership
3. Trademark control
4. Media ownership

2. Position of social leadership

1. Leadership position
2. Committer rights

Control Using Intellectual Property Rights

- Through copyright ownership
 - Changing the license going forward
- Through trademark ownership
 - Withdrawing usage trademark right
- Through patent ownership
 - Charging patent license fees
- Through media ownership
 - Use of media to your advantage

Steering Using Social Leadership

- Through social leadership position
 - Splitting the project community, diminishing its power
 - Keeping unwanted people out of the project
- Through committer rights
 - Delaying or rejecting unwanted contributions
 - Leading the technical direction of the project

Summary

1. Legal definition
2. A (very) short history
3. Open source licenses
4. Open source license compliance
5. Open source governance
6. Problems with using open source
7. Open source control mechanisms

Thank you! Questions?

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