Intellectual Property and Open Source

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FLOSS B02

1. **Legal innovation**
2. **Process innovation**
3. **Software tool innovation**
4. **Business model innovation**

Intellectual Property (IP)

- Property
  - Is some tangible or intangible entity
  - Has an owner who has legal title to the property

- Intellectual property is property that is
  - Conceptual, i.e. non-tangible and usually non-fungible
  - Unique, i.e. not-a-commodity, not-interchangeable

- Intellectual property rights are **exclusion rights**
  - The owner has the right to exclude others from use

Three Types of Intellectual Property

1. **Copyright**

2. **Patent rights**

3. **Trademark rights**

Copyright

- Copyright is a right to intellectual property
  - **For a specific expression, initially given to creator of work**
  - To exclude anyone from presentation, reproduction, modification
  - It will eventually expire and the work will enter the public domain

- Copyright law varies by jurisdiction
  - Under U.S. law, can be signed over to third person
  - Under German law (Urheberrecht) only usage rights can be granted
  - Interpretation of one law in another jurisdiction is questionable

- In software, examples of works that can be copyrighted are
  - User interface designs
  - Source code

Patent Rights

- A patent right is a right to intellectual property

  - **For a non-obvious industrial invention**
  - To exclude anyone from using the invention
  - It will eventually expire; invention will enter the public domain

- Patent right goal is foster innovation by motivating disclosure
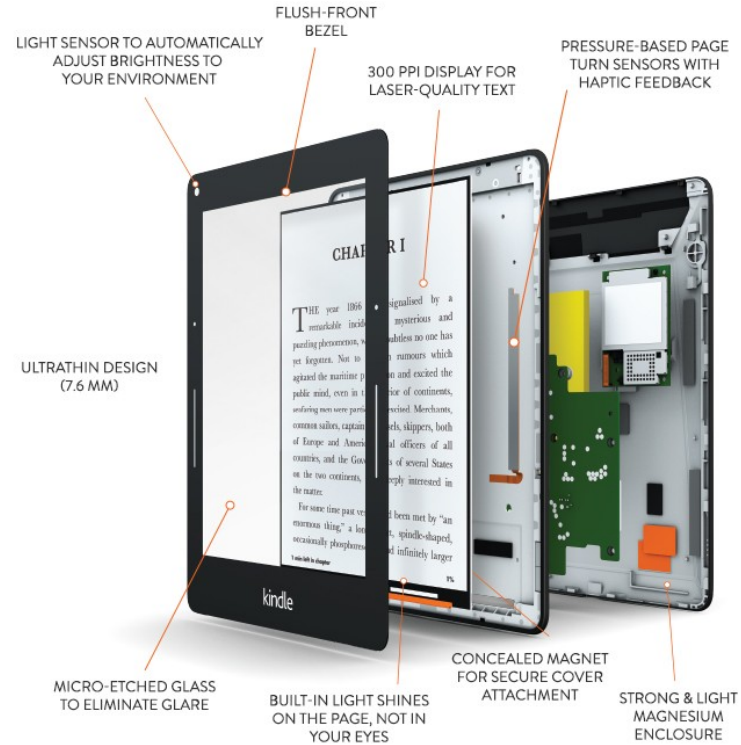
6
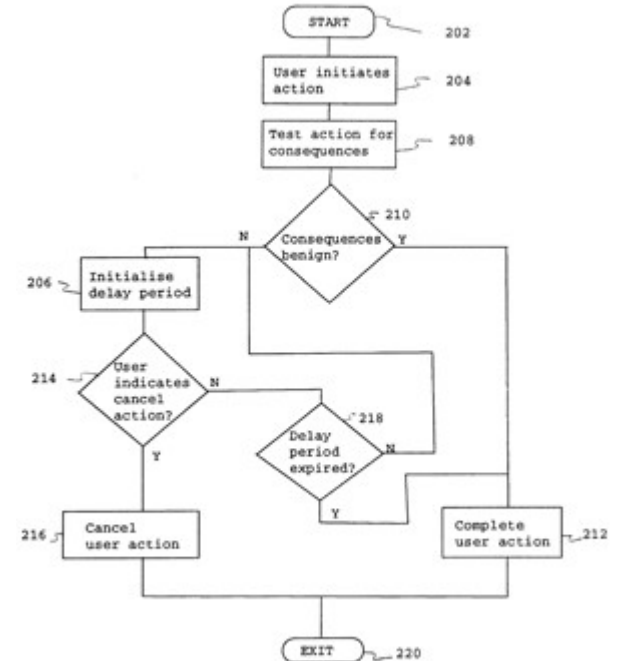
Trademark Rights

- Trademark rights are a right to intellectual property
  - **For a distinctive textual or visual sign, smell, sound**
  - To exclude anyone from using the sign, smell, sound
  - They never expire, if registered and enforced ("use it or lose it")

Quiz: Identify the Intellectual Property

Kindle Voyage

- LIGHT SENSOR TO AUTOMATICALLY ADJUST BRIGHTNESS TO YOUR ENVIRONMENT
- FLUSH-FRONT BEZEL
- 300 PPI DISPLAY FOR LASER-QUALITY TEXT
- PRESSURE-BASED PAGE TURN SENSORS WITH HAPTIC FEEDBACK
- ULTRATHIN DESIGN (7.6 MM)
- MICRO-ETCHED GLASS TO ELIMINATE GLARE
- BUILT-IN LIGHT SHINES ON THE PAGE, NOT IN YOUR EYES
- CONCEALED MAGNET FOR SECURE COVER ATTACHMENT
- STRONG & LIGHT MAGNESIUM ENCLOSURE

Exclusion Rights in Comparison

	Copyright	Patents	Trademarks
Form	Text, other specific expressions of non-trivial complexity	Abstract idea that represents a non-trivial industrial invention	Equivalence set of uniquely identifiable expressions
Purpose	To promote otherwise unprotectable artistic expression by protecting it	To spur innovation by motivating the disclosure of trade secrets	To protect consumers from confusion by providing unique marks
Duration	Will eventually expire, but only after several decades	Will eventually expire, but only after a few decades (shorter than copyright)	Will not expire as long as it is enforced by trademark owner
Granting	Automatic by creation	By application to patent office	By application to trademark authority

License

- A license is a contract (rights grant) (in most jurisdictions)
  - Between a licensor and a licensee to
    - Reproduce, adapt, modify, translate, publish, publicly perform or display, distribute
    - Some tangible or intangible property

  - Is only valid if the licensor can actually grant these rights

- The rights grant can be
  - Perpetual, irrevocable, worldwide, royalty-free, exclusive

- The most common license type is the EULA
  - EULA = End-user License Agreement

- What are the opposites of these terms and what do they mean?
    - Perpetual
    - Irrevocable
    - Worldwide
    - Royalty-free
    - Exclusive

Software License

- A software license is a license about software

  - Based on exclusion rights, a software license may provide permission to ...
    - Use
    - Reproduce
    - Adapt
    - Modify
    - Translate
    - Publish
    - Publicly perform or display
    - Distribute

- Is typically based on copyright, trademarks and patents

Free / Libre and Open Source Licenses

- An open source license is a software license

  - That grants the rights to …
    - Receive, display, perform, modify, and redistribute

  - Some piece of software free of charge

- Open source licenses are non-discriminatory
- Early licenses focused on copyright, ignored patents
- May come with obligations, not just rights
- Are maintained by the FSF and OSI

The Four Freedoms of Free Software [F10]

- The freedom to run the program as you wish, for any purpose (freedom 0).

- The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.

- The freedom to redistribute copies so you can help your neighbor (freedom 2).

- The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

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Version 2, June 1991

```
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```

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The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

Copyleft ("Reciprocal") License

- Copyleft is a copyright-based strategy to ensure original rights cannot be curtailed when passed from licensor to licensee

- The licensee of copyleft-licensed software will have to use the same copyleft license (or later) when passing on the software

C → Licensor / Licensee → **V** → Licensor / Licensee → **U**

original distribution   **redistribution**
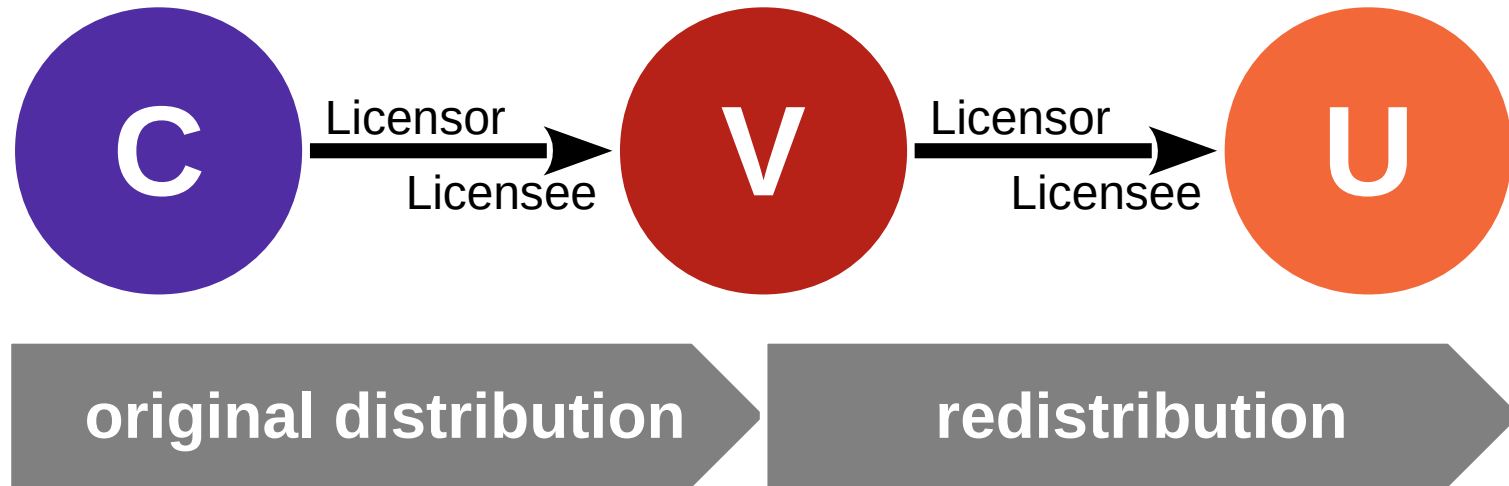
Quiz: Charging for Copyleft Code

- Can you charge someone before you give them access to copyleft-licensed software?
  - Yes
  - No

Free as in Freedom, not as in Beer

```
/*
 * -----------------------------------------------------------------------
 * "THE BEER-WARE LICENSE" (Revision 42):
 * <phk@FreeBSD.ORG> wrote this file. As long as you retain this notice you
 * can do whatever you want with this stuff. If we meet some day, and you think
 * this stuff is worth it, you can buy me a beer in return Poul-Henning Kamp
 * -----------------------------------------------------------------------
 */
```

Open Source Software License 1 / 2 [O10]

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2. Source Code

The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost preferably, downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed.

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Open Source Software License 2 / 2

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No provision of the license may be predicated on any individual technology or style of interface.

Apache License

Version 2.0, January 2004

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1. **License File**

2. **File Header**

3. **More ...**

Example License in File Header

```
/*
 * Copyright (c) 200X-200X by Humpty Dumpty
 *
 * This file is part of the Humpty Dumpty application.
 *
 * This program is free software: you can redistribute it and/or modify
 * it under the terms of the GNU Affero General Public License as
 * published by the Free Software Foundation, either version 3 of the
 * License, or (at your option) any later version.
 *
 * This program is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  See the
 * GNU Affero General Public License for more details.
 *
 * You should have received a copy of the GNU Affero General Public
 * License along with this program. If not, see
 * <http://www.gnu.org/licenses/>.
 */

package com.firm.model;
...
```

How to be License Compliant?

1. Copyright notice
2. Disclaimer
3. More ...

DO WHAT THE FUCK YOU WANT TO PUBLIC LICENSE
Version 2, December 2004

1

Copyright (C) 2004 Sam Hocevar

2

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3

0. You just DO WHAT THE FUCK YOU WANT TO.

Freedom vs. Freedom

- Copyleft freedom
  - Freedom for the software, primarily

- Permissive freedom
  - Freedom for the developer, primarily
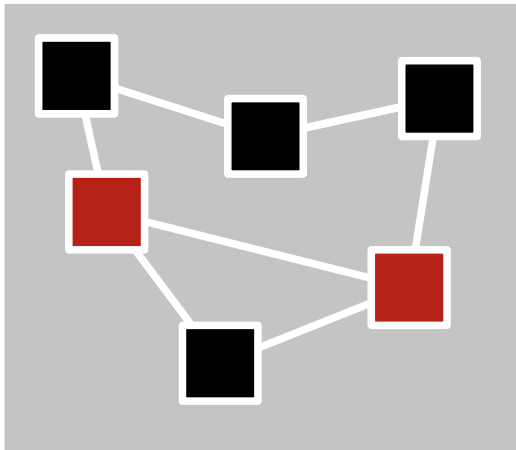
Collective vs. Derivative Work

- In U.S. copyright law,

    - A "collective work" is a work, such as a periodical issue, anthology, or encyclopedia, in which a number of contributions, constituting separate and **independent works in themselves, are assembled into a collective whole.**

    - A "derivative work" is a work based upon one or more preexisting works, such as a translation, musical arrangement . . . art reproduction, abridgement, condensation, or any other form in which a work may be recast, transformed, or adapted. A **work consisting of editorial revisions, annotations, elaborations, or other modifications** which, as a whole, represent an original work of authorship, **is a "derivative work."**

- Copyleft effect only applicable to derivative, not collective works

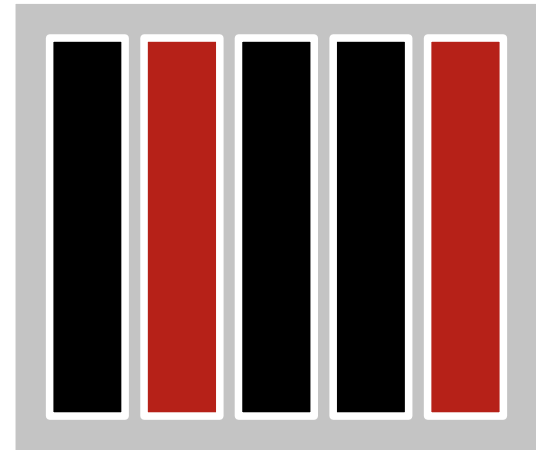# Derivative, Combined, and Collective Work

Derivative work

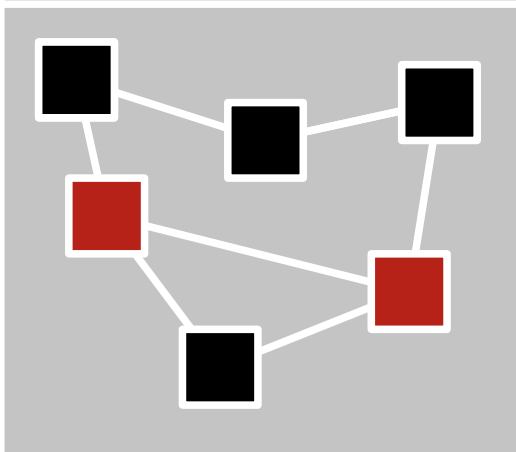**Combined work**

Collective work

Copyleft Effect and Derivative Work

Licensor perspective on copyleft effect
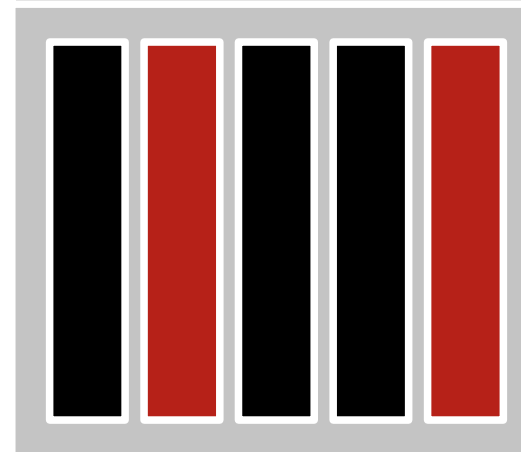Freedom of code for receiver of redistribution

Derivative work

Combined work

Collective work

Licensee perspective on non-copyleft effect
Freedom of choice for licensor how to redistribute

Reciprocal vs. Permissive License

- GNU Public License v2

  - It permits

    – Use of the software

  - It requires

    – **Open sourcing of modifications upon redistri-bution**
    – Proper attribution
    – Inclusion of license in distribution

  - It forbids

    – Claims of endorsement
    – Use of FSF trademarks

- Apache License 2.0

  - It permits

    – Use of the software
    – **Redistribution of modification without open sourcing**

  - It requires

    – Proper attribution
    – Inclusion of license in distribution

  - It forbids

    – Claims of endorsement
    – Use of ASF trademarks

Critical License (Design) Issues

- **Triggers for having to open source**

  - **Definition of collective vs. derivative work**
  - **Definition of redistribution**

- Other obligations put on redistributions

  - Display of attribution, copyright notice
  - How to treat source code, provision of license files

- Other considerations

  - Provision of exceptions to standard license
  - Also, jurisdiction matters, no single global legal system

Quiz: Collective or Derivative Work?

- In a project, you use file X which is GPLv2 licensed

  - You change file X to become X'
    - Is file X' a collective or derivative work?

  - You create a class A in file Y which subclasses a class from file X
    - Is file Y a collective or a derivative work?

  - You create code in file Z which uses code from file X
    - Is file Z a collective or a derivative work?

  - You statically link file X and file Y into file A
    - Is file A a collective or a derivate work?

  - You dynamically link file Z with file X and deliver the files to your customer
    - Is file Z a collective or a derivative work?

  - You create file B, code of which makes a web service call to file X
    - Is file B a collective or a derivative work?

Decoupling Components Using Shims

Proprietary Code ◄──► **Shim** ◄──► **Copyleft Code**

The GPL License Family

	v1	v2	v3
library	LGPLv1	LGPLv2	LGPLv3
regular	GPLv1	GPLv2	GPLv3
web service	–	–	AGPLv3

Use Case

Major Release

New in the GPLv3 License Family

- Introduction of new use case "web service"

  - Affero GPLv3 license considers use of web service licensing of software

- Introduction of patent clauses, in particular patent retaliation

  - An attempt to stem the tide of (mostly) non-sensical software patents

- Increased compatibility with other open source licenses

Quiz: Licenses and Business Strategy

- Google Code used to be a code hosting facility for open source projects. Initially, Google only allowed for a subset of licenses. Why?

  1. Too many licenses confuse users
  2. Some licenses are good for Google, some are not
  3. Some licenses were not possible to use for Google Code hosted projects

Google code

The official Google Code blog
Get the latest updates on Google APIs and developer tools.

Friday, September 10, 2010

License Evolution and Hosting Projects on Code.Google.Com

Nearly 6 years ago when we first started thinking about doing project hosting on code.google.com we noticed something particular about the other open source project hosting sites. They either accepted all Open Source Initiative (OSI) approved licenses, like Sourceforge, or they only accepted one, like the Free Software Foundation's Savannah project, which only accepted GPL'd projects.

In our day-to-day work looking after open source licensing, we lamented the proliferation of licenses and decided that we would split the difference and only offer a very limited subset of the approved OSI licenses choices to our users as a stand against the proliferation of the same. You see, we felt then and still feel now that the excessive number of open source licenses presents a problem for open source developers and those that adopt that software. Thus when we launched project hosting on code.google.com, we only launched with a small subset of licenses.

This was hardly a barrier to adoption. While there were some complaints from some corners, in the intervening 5+ years since then, we've grown to become one of the largest hosts while allowing that ethic behind license choice to persist.

What's changing and why change now?

We've added an option to the license selector to allow any project to use an OSI approved license. Simply select "other open source" and indicate in your LICENSING, COPYING or similar file which license you are using.

Simon Says...

Simon Phipps

Google Ends AGPL Embargo

After nearly six years of going its own way, Google finally brings its code hosting site into harmony with the FSF and OSI.

Published 21:18, 13 September 10

In a low-key announcement at the end of last week, Google's open source supremo Chris DiBona announced that their project hosting service, Google Code, is ending its embargo on open source licenses they don't like. These include the Free Software Foundation's (FSF) controversial AGPLv3 (a licence designed to make the give-back compulsion of the GNU GPL apply to web-hosted services like the ones Google provides) and Sun's CDDL (the licence used by OpenSolaris and by many of the former Sun's Java projects).

Google Code won't actually list any of these 'minority' licences as an option for new projects, but they will at least allow applicants to write in a box the name of the licence they have chosen to use, presumably for manual verification by a Google employee. While the company still discourages use of any licences not on its 'preferred' list, on the laudable grounds of discouraging casual licence proliferation, projects may now use any open

Patents and Open Source Licenses

- Patent rights grant

  - §3 of the Apache License 2.0:

    - "Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted."

- So-called patent retaliation clause

  - §3 of the Apache License 2.0 continued:

    - "If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed."

License Categories

- Strong copyleft licenses
  - **Purpose: Free the software**
  - Try to apply copyleft as far as they can
  - A.k.a. "reciprocal" or "protective"

- Weak copyleft licenses
  - **Purpose: Benefit business models with limited restrictions**
  - Limit copyleft effect to modifications of work
  - A.k.a. "reciprocal" or "protective"

- Permissive licenses
  - **Purpose: Trust self-interest, no restriction of business models**
  - Do not apply copyleft effect

The State of Open Source Licenses

- More than 50 approved active licenses

  - Some licenses are general-purpose, some are product specific

  - Licenses often have a matching "telling" name, e.g. MIT, zlib

  - More than ten licenses have been retired

- Common license properties

  - No warranties given or implied (to the extent permittable by law)

  - Almost all require attribution
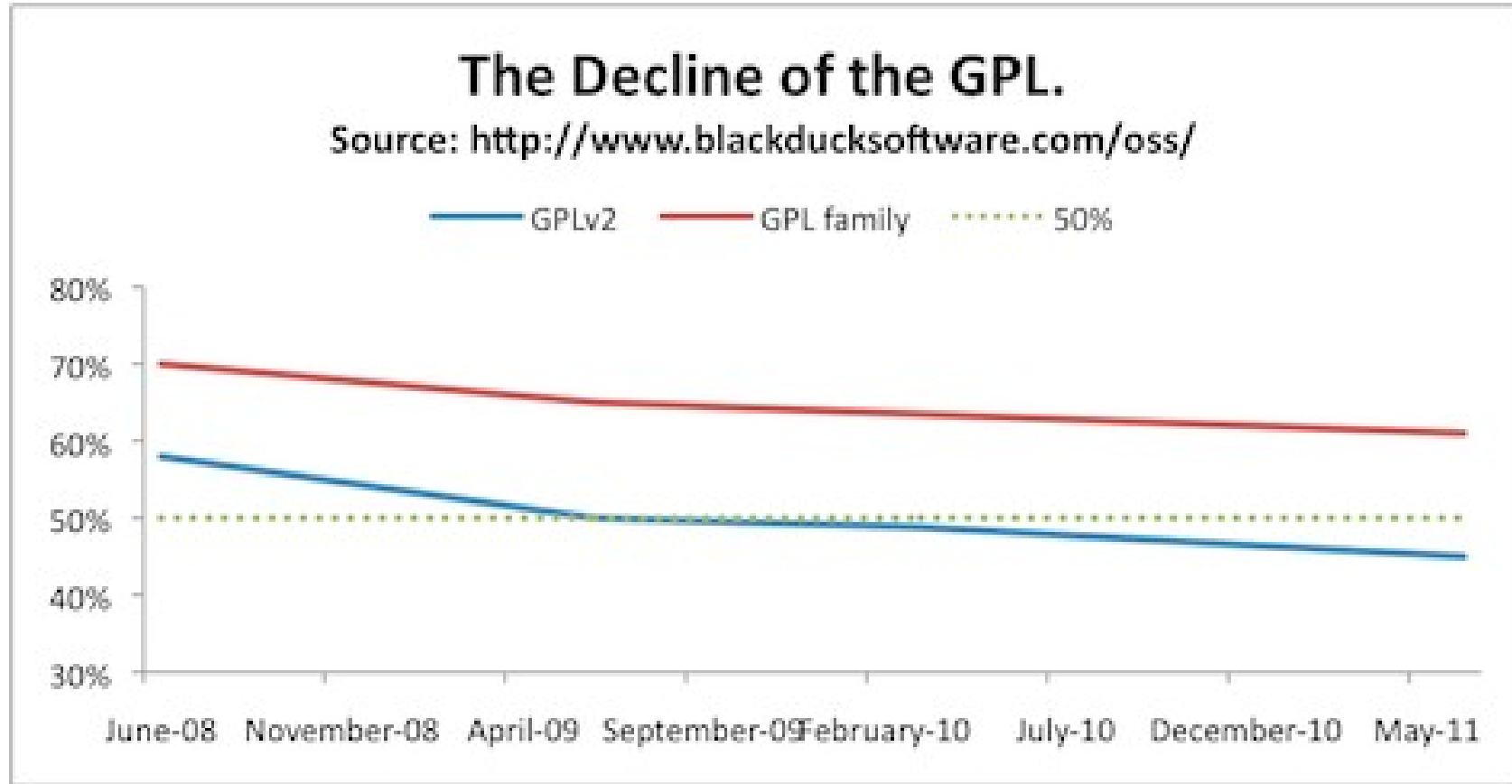
The Top 20 Licenses in 2009 [B09] and in 2016

2009

#	Name	Market Share
1	GNU General Public License (GPL) 2.0	52.20%
2	GNU Lesser General Public License (LGPL) 2.1	9.84%
3	Artistic License (Perl)	9.01%
4	BSD License 2.0	6.27%
5	GNU General Public License (GPL) 3.0	4.15%
6	Code Project Open 1.02 License	3.59%
7	Apache License 2.0	3.58%
8	MIT License	3.32%
9	Mozilla Public License (MPL) 1.1	1.25%
10	Common Public License (CPL)	0.64%
11	zlib/libpng License	0.51%
12	Academic Free License	0.43%
13	Eclipse Public License (EPL)	0.40%
14	Open Software License (OSL)	0.37%
15	GNU Lesser General Public License (LGPL) 3.0	0.37%
16	Mozilla Public License (MPL) 1.0	0.30%
17	PHP License Version 3.0	0.28%
18	Ruby License	0.26%
19	Sun Berkeley License (BSD 2+)	0.18%
20	Common Development and Distribution License	0.16%

2016

#	Name	Market Share
1	GNU General Public License (GPL) 2.0	25%
2	MIT License	19%
3	Apache License 2.0	16%
4	GNU General Public License (GPL) 3.0	10%
5	BSD License 2.0 (3-clause, New or Revised)	7%
6	Artistic License (Perl)	5%
7	GNU Lesser General Public License (LGPL) 2.1	5%
8	GNU Lesser General Public License (LGPL) 3.0	2%
9	Microsoft Public License	2%
10	Eclipse Public License (EPL)	2%
11	Code Project Open License 1.02	1%
12	Mozilla Public License (MPL) 1.1	< 1%
13	Simplified BSD LIcense (BSD)	< 1%
14	Common Development and Distribution License	< 1%
15	GNU Affero General Public License v3 or later	< 1%
16	Microsoft Reciprocal License	< 1%
17	Sun GPL with Classpath Exception v2.0	< 1%
18	CDDL-1.1	< 1%
19	zlib/libpng License	< 1%
20	Common Public License (CPL)	< 1%

The Decline of the GPL.
Source: http://www.blackducksoftware.com/oss/
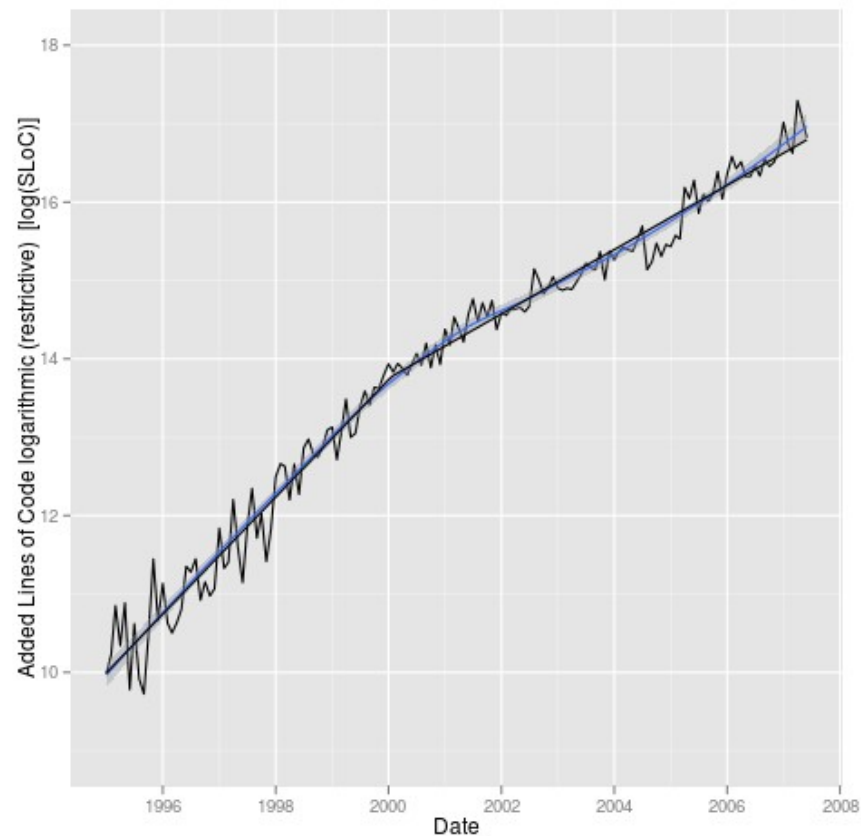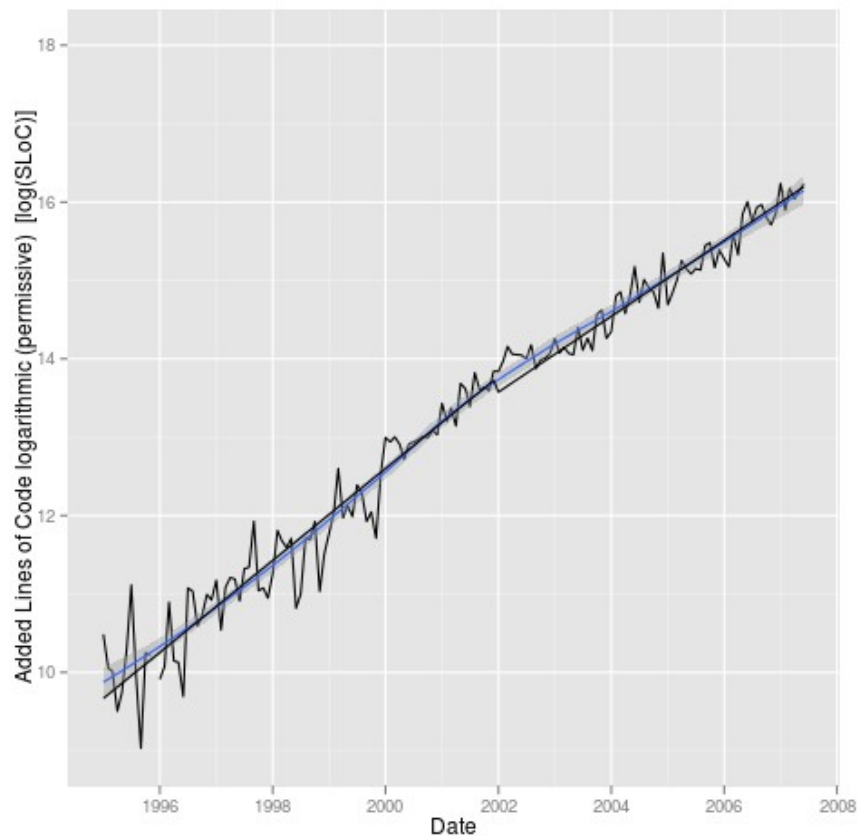
- You are a developer. Please consider the following scenarios:

    1. On company-time, you make a contribution to the Linux kernel
    2. In your private time, you make a contribution to the Linux kernel [1]
    3. You adjust some code from the web and contribute it to the Linux kernel
    4. You implemented a new cryptography algorithm and contribute it

    Who holds which rights and who has to sign off on what?

[1] This is a hypothetical. In practice, it is difficult to contribute to the Linux kernel, see lecture on open source software engineering.

Contributor License Agreement

- A contributor license agreement

  - Is a contract that legally clarifies any contributions you make to a project
  - Needs to be signed by the owner of the rights (company or developer)

- At least two variants of the contributor agreement

  - **Copyright transfer:** The developer transfers all relevant rights
  - **Relicensing rights grant:** The developer grants relicensing rights

- The (stalled) Harmony project tried to unify these agreements

  - Apparently, unification of contributor agreements wasn't that important
  - Some argue that the open source license is enough

Developer Certificate of Origin [T08]

```
Developer's Certificate of Origin 1.1

By making a contribution to this project, I certify that:

(a)   The contribution was created in whole or in part by me and I have the right to submit it under
      the open source license indicated in the file; or

(b)   The contribution is based upon previous work that, to the best of my knowledge, is covered under
      an appropriate open source license and I have the right under that license to submit that work
      with modifications, whether created in whole or in part by me, under the same open source
      license (unless I am permitted to submit under a different license), as indicated in the file;
      or

(c)   The contribution was provided directly to me by some other person who certified (a), (b) or (c)
      and I have not modified it.

(d)   I understand and agree that this project and the contribution are public and that a record of
      the contribution (including all personal information I submit with it, including my sign-off) is
      maintained indefinitely and may be redistributed consistent with this project or the open source
      license(s) involved.
```

```
Signed-off-by: Random J Developer <random@developer.example.org>
[lucky@maintainer.example.org: struct foo moved from foo.c to foo.h]
Signed-off-by: Lucky K Maintainer <lucky@maintainer.example.org>
```

License Evolution

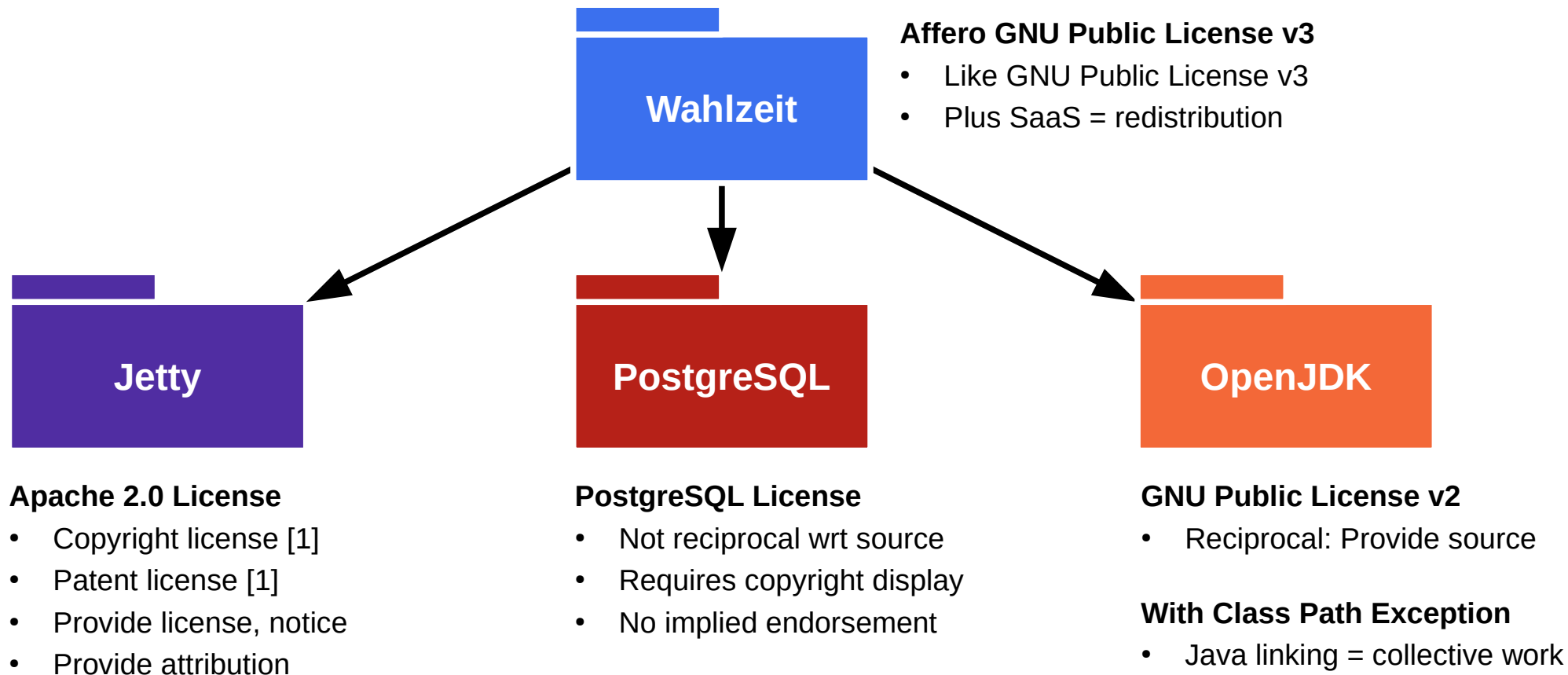- Licenses often evolve over several versions (GPLv1, v2, v3, …)

  - Licenses often allow for their replacement by a later version
  - This allows the copyright holder of the license to fix problems

- This allowed Wikipedia to move from the GFDL to CC-BY-SA

  - The FSF and CreativeCommons created special licenses for Wikipedia
  - By evolving through these "later" licenses, Wikipedia switched to CC
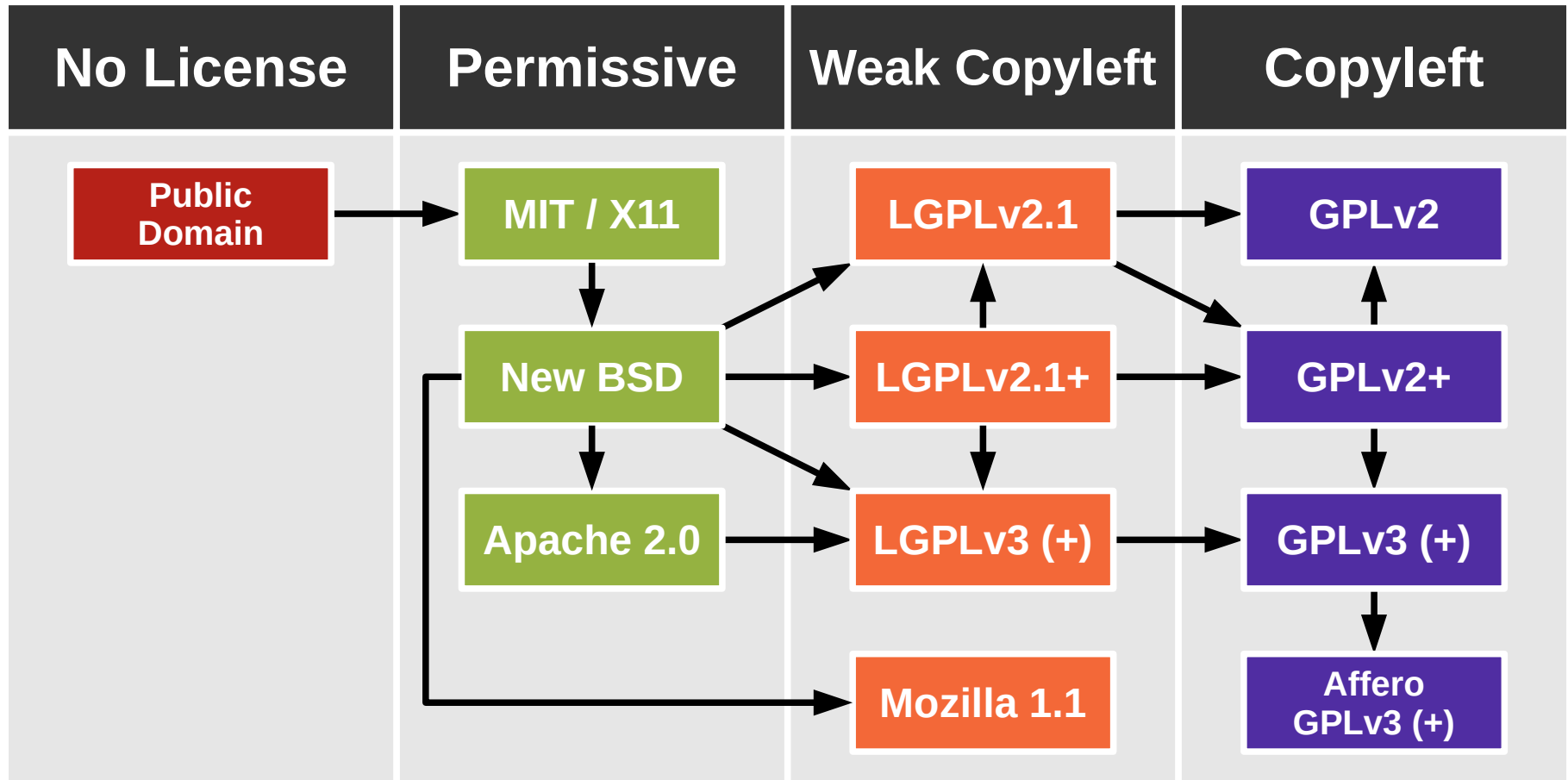
Dual and Multiple Licensing

- Some software source code has multiple licenses

- Users can choose the license they like best for their purposes

- Dual-licensed software can act as a shim between two components

Example Package Structure

Wahlzeit

Affero GNU Public License v3

- Like GNU Public License v3
- Plus SaaS = redistribution

Jetty

PostgreSQL

OpenJDK

Apache 2.0 License

- Copyright license [1]
- Patent license [1]
- Provide license, notice
- Provide attribution

PostgreSQL License

- Not reciprocal wrt source
- Requires copyright display
- No implied endorsement

GNU Public License v2

- Reciprocal: Provide source

With Class Path Exception

- Java linking = collective work

[1] Perpetual, worldwide, non-exclusive, royalty-free, irrevocable

The License Compatibility Circus [W09]

No License	Permissive	Weak Copyleft	Copyleft
Public Domain	**MIT / X11**	**LGPLv2.1**	**GPLv2**
	New BSD	**LGPLv2.1+**	**GPLv2+**
	Apache 2.0	**LGPLv3 (+)**	**GPLv3 (+)**
		Mozilla 1.1	**Affero GPLv3 (+)**

- Intellectual property
  - Intellectual property rights
    - Copyright, patents, trademarks

- Open source licenses
  - Copyleft vs. permissive licenses
    - Historic and current use

  - Derivative vs. combined work
  - Licensing as a business strategy
  - License compatibility

- Intellectual property management

Thank you! Questions?

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DR

Credits and License

- Original version
  - © 2012-2019 Dirk Riehle, all rights reserved

- Contributions
  - ...