

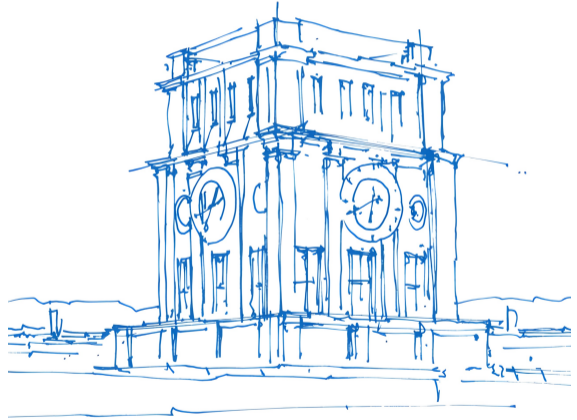
# Open Source Lab

## Open Source Licenses

### Sebastian Kappes

Chair of Connected Mobility  
TUM School of Computation, Information and Technology  
Technical University of Munich

Garching, November 20, 2024



*Uhrenturm der TUM*

# What is a license and why do we need it?

## Example

- While browsing the Internet, you stumble upon a code repository that you find interesting.
- Are you allowed to use this source code?

## Example

- While browsing the Internet, you stumble upon a code repository that you find interesting.
- Are you allowed to use this source code?
  - ⇒ By default: **no**

## Example

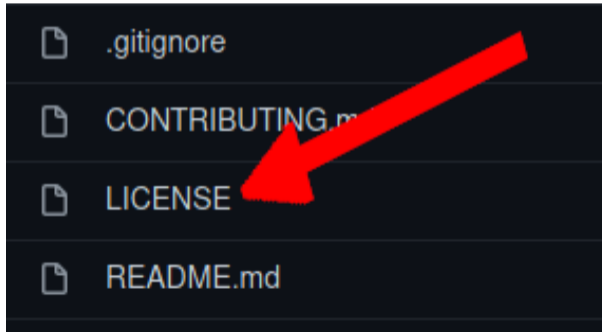
- While browsing the Internet, you stumble upon a code repository that you find interesting.
- Are you allowed to use this source code?
  - ⇒ By default: **no**
- Source code is under **exclusive copyright** unless stated otherwise

## Example

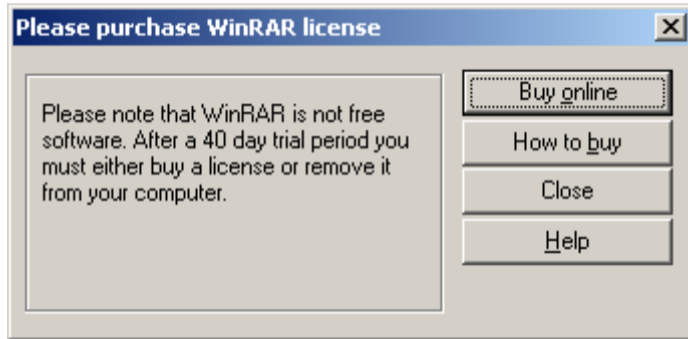
- While browsing the Internet, you stumble upon a code repository that you find interesting.
- Are you allowed to use this source code?
  - ⇒ By default: **no**
- Source code is under **exclusive copyright** unless stated otherwise
  - ⇒ A **license** is needed to specify what others are allowed to do with the program / the source code.

## Example

- While browsing the Internet, you stumble upon a code repository that you find interesting.
- Are you allowed to use this source code?
  - ⇒ By default: **no**
- Source code is under **exclusive copyright** unless stated otherwise
  - ⇒ A **license** is needed to specify what others are allowed to do with the program / the source code.



# What makes a license “Open Source”?



<sup>0</sup>[img.src.:https://www.hacktrix.com/wp-content/uploads/2009/04/remove-winrar-purchase-alert.png](https://www.hacktrix.com/wp-content/uploads/2009/04/remove-winrar-purchase-alert.png)



## What Makes A License “Open Source”?

- Multiple definitions exist (some of them based on one another).
  - **The Free Software Definition** (from GNU / the FSF; a.k.a. “The Four Freedoms”)<sup>1</sup>
  - **Debian Free Software Guidelines**<sup>2</sup>
  - **The Open Source Definition** (from the OSI)<sup>3</sup>

---

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

<sup>2</sup>[https://www.debian.org/social\\_contract.en.html](https://www.debian.org/social_contract.en.html)

<sup>3</sup><https://opensource.org/osd>

## What Makes A License “Open Source”?

- Multiple definitions exist (some of them based on one another).
    - **The Free Software Definition** (from GNU / the FSF; a.k.a. “The Four Freedoms”)<sup>1</sup>
    - **Debian Free Software Guidelines**<sup>2</sup>
    - **The Open Source Definition** (from the OSI)<sup>3</sup>
- ⇒ The license must grant the user **certain rights**.

---

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

<sup>2</sup>[https://www.debian.org/social\\_contract.en.html](https://www.debian.org/social_contract.en.html)

<sup>3</sup><https://opensource.org/osd>

# What Makes A License “Open Source”?

## Free Software Definition<sup>4</sup>

0. The Freedom to run the program as you wish, for any purpose.
1. The Freedom to study how the program works, and change it so it does your computing as you wish.
2. The freedom to redistribute copies so you can help others.
3. The freedom to distribute copies of your modified versions to others.

## Open Source Definition<sup>5</sup>

1. Free Redistribution
2. [Program must include] Source Code
3. Derived Works [can be published]
4. Integrity of The Author's Source Code
5. No Discrimination Against Persons or Groups
6. No Discrimination Against Fields of Endeavor
7. Distribution of License
8. License Must Not Be Specific to a Product
9. License Must Not Restrict Other Software
10. License Must Be Technology-Neutral

---

<sup>4</sup><https://www.gnu.org/philosophy/free-sw.html.en>

<sup>5</sup><https://opensource.org/osd>

# Let's take a look at some Licenses!

## The 2-Clause BSD License<sup>6</sup>

Copyright <YEAR> <COPYRIGHT HOLDER>

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

[...]

---

<sup>6</sup><https://spdx.org/licenses/BSD-2-Clause.html>

## The MIT License (a.k.a. “The Expat License”)<sup>7</sup>

Copyright <YEAR> <COPYRIGHT HOLDER>

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

[...]

---

<sup>7</sup><https://spdx.org/licenses/MIT.html>

## Apache License 2.0<sup>8</sup>

- Similar to BSD and MIT licenses, but with an extra clause against [patent treachery](#).

---

<sup>8</sup><https://www.apache.org/licenses/LICENSE-2.0.html>

## Apache License 2.0<sup>8</sup>

- Similar to BSD and MIT licenses, but with an extra clause against [patent treachery](#).

[...] 3. Grant of Patent License. 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. 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. [...]

---

<sup>8</sup><https://www.apache.org/licenses/LICENSE-2.0.html>



## A Possible Problem

- You publish a program under one of the aforementioned licenses.

## A Possible Problem

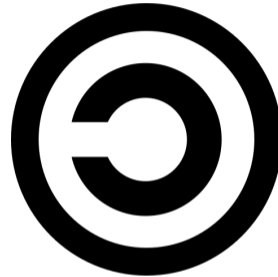
- You publish a program under one of the aforementioned licenses.
- Somebody else improves your program but then decides to distribute it under a [proprietary license](#).

## A Possible Problem

- You publish a program under one of the aforementioned licenses.
  - Somebody else improves your program but then decides to distribute it under a [proprietary license](#).
- ⇒ **People can run off with your source code without any guarantee that it will remain open source.**

## The Solution: Copyleft

- Copyleft licenses demand that the program can **only** be redistributed under the [same license](#).



---

<sup>9</sup><https://www.gnu.org/licenses/gpl-3.0.en.html>

## The Solution: Copyleft

- Copyleft licenses demand that the program can **only** be redistributed under the [same license](#).
  - Applies to both modified and unmodified versions of the program.



---

<sup>9</sup><https://www.gnu.org/licenses/gpl-3.0.en.html>

## The Solution: Copyleft

- Copyleft licenses demand that the program can **only** be redistributed under the **same license**.
  - Applies to both modified and unmodified versions of the program.
  - Guarantees that the program will **always remain open-source**.

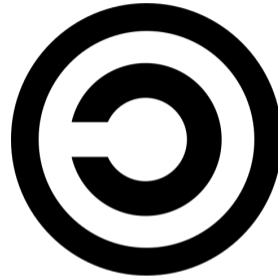


---

<sup>9</sup><https://www.gnu.org/licenses/gpl-3.0.en.html>

## The Solution: Copyleft

- Copyleft licenses demand that the program can **only** be redistributed under the **same license**.
  - Applies to both modified and unmodified versions of the program.
  - Guarantees that the program will **always remain open-source**.
  - Incentivizes programmers to **contribute back** to the project.

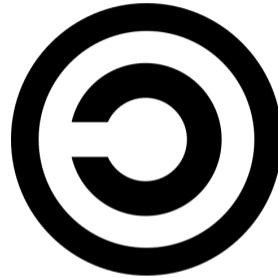


---

<sup>9</sup><https://www.gnu.org/licenses/gpl-3.0.en.html>

## The Solution: Copyleft

- Copyleft licenses demand that the program can **only** be redistributed under the **same license**.
  - Applies to both modified and unmodified versions of the program.
  - Guarantees that the program will **always remain open-source**.
  - Incentivizes programmers to **contribute back** to the project.
- The **GNU General Public License (GPL)**<sup>9</sup> is the most widely adopted copyleft license.



---

<sup>9</sup><https://www.gnu.org/licenses/gpl-3.0.en.html>



# Potential Problems With Copyleft and How to Overcome Them

- Libraries
- Server-Side Applications
- Incompatible Copyleft Licenses

---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>

# Potential Problems With Copyleft and How to Overcome Them

## ■ Libraries

- Programs that link to a GPL-licensed library will also have to use the same license.

## ■ Server-Side Applications

## ■ Incompatible Copyleft Licenses

---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>

## Potential Problems With Copyleft and How to Overcome Them

### ■ Libraries

Programs that link to a GPL-licensed library will also have to use the same license.

⇒ **The Lesser GPL (LGPL)**<sup>10</sup> allows linking even if a different license is used.

### ■ Server-Side Applications

### ■ Incompatible Copyleft Licenses



---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>

# Potential Problems With Copyleft and How to Overcome Them

## ■ Libraries

- Programs that link to a GPL-licensed library will also have to use the same license.
- ⇒ **The Lesser GPL (LGPL)**<sup>10</sup> allows linking even if a different license is used.

## ■ Server-Side Applications

- Technically not “distributed” but accessed through a network.

## ■ Incompatible Copyleft Licenses



---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>

# Potential Problems With Copyleft and How to Overcome Them

## ■ Libraries

- Programs that link to a GPL-licensed library will also have to use the same license.
- ⇒ **The Lesser GPL (LGPL)**<sup>10</sup> allows linking even if a different license is used.

## ■ Server-Side Applications

- Technically not “distributed” but accessed through a network.
- ⇒ How can we enforce copyleft?

## ■ Incompatible Copyleft Licenses



---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>

# Potential Problems With Copyleft and How to Overcome Them

## ■ Libraries

- Programs that link to a GPL-licensed library will also have to use the same license.
- ⇒ **The Lesser GPL (LGPL)**<sup>10</sup> allows linking even if a different license is used.

## ■ Server-Side Applications

- Technically not “distributed” but accessed through a network.
- ⇒ How can we enforce copyleft?
- ⇒ **The Affero GPL (AGPL)**<sup>11</sup> also requires the disclosing of the source code if users can interact with the program through a network.

## ■ Incompatible Copyleft Licenses



---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>

# Potential Problems With Copyleft and How to Overcome Them

## ■ Libraries

- Programs that link to a GPL-licensed library will also have to use the same license.
- ⇒ **The Lesser GPL (LGPL)**<sup>10</sup> allows linking even if a different license is used.

## ■ Server-Side Applications

- Technically not “distributed” but accessed through a network.
- ⇒ How can we enforce copyleft?
- ⇒ **The Affero GPL (AGPL)**<sup>11</sup> also requires the disclosing of the source code if users can interact with the program through a network.

## ■ Incompatible Copyleft Licenses

- ZFS in Linux<sup>12</sup>



---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>

# Potential Problems With Copyleft and How to Overcome Them

## ■ Libraries

- Programs that link to a GPL-licensed library will also have to use the same license.
- ⇒ **The Lesser GPL (LGPL)**<sup>10</sup> allows linking even if a different license is used.

## ■ Server-Side Applications

- Technically not “distributed” but accessed through a network.
- ⇒ How can we enforce copyleft?
- ⇒ **The Affero GPL (AGPL)**<sup>11</sup> also requires the disclosing of the source code if users can interact with the program through a network.

## ■ Incompatible Copyleft Licenses

- ZFS in Linux<sup>12</sup>
- ⇒ When choosing a copyleft license for your own project, **always** use the GPL (or a compatible license).



---

<sup>10</sup><https://www.gnu.org/licenses/lgpl-3.0.html.en>

<sup>11</sup><https://www.gnu.org/licenses/agpl-3.0.en.html>

<sup>12</sup><https://sfconservancy.org/blog/2016/feb/25/zfs-and-linux/>



## Contributor License Agreements (CLAs)

- Some projects would like to retain the ability to change the license of program.

## Contributor License Agreements (CLAs)

- Some projects would like to retain the ability to change the license of program.
- Contributors must sign a [Contributor License Agreement \(CLA\)](#) before they can contribute.

## Contributor License Agreements (CLAs)

- Some projects would like to retain the ability to change the license of program.
  - Contributors must sign a [Contributor License Agreement \(CLA\)](#) before they can contribute.
- ⇒ It's up to you if you want to do this.

## Public Domain: The Easy Option

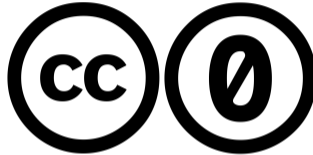
- Instead of retaining copyright and using a license, one can also release the program into the [public domain](#).

---

<sup>13</sup><https://creativecommons.org/publicdomain/zero/1.0/legalcode>

## Public Domain: The Easy Option

- Instead of retaining copyright and using a license, one can also release the program into the **public domain**.
- ⇒ **The CC0 dedication**<sup>13</sup> allows you to waive your copyright to the extent permissible by law.



---

<sup>13</sup><https://creativecommons.org/publicdomain/zero/1.0/legalcode>

## Further Reading

- <https://choosealicense.com/>
- GNU's list of "Various Licenses and Comments about Them"  
<https://www.gnu.org/licenses/license-list.html.en>
- The OSI's resources on licenses  
<https://opensource.org/licenses>
- GNU's guide to choosing a licences (interesting w.r.t. copyleft)  
<https://www.gnu.org/licenses/license-recommendations.html>