

# Open Source

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# Administrivia

- HW6 is the “Open Source Excursion”
  - Dates are challenging because of Thanksgiving
    - We DO NOT expect you to work over break, but we don’t want to wait to release the HW so you are not in the dark
- Please let us know if you have questions about projects and/or issues.

# Learning goals

- Understand the terminology “free software” and explain open source culture and principles.
- Express an educated opinion on the philosophical/political debate between open source and proprietary principles.

# Open Source

aka Free Software

aka Free and Open Source Software

# “Free as in free speech.”



# Open Source

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**Open Source Initiative**  
Guaranteeing the 'our' in source...

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**Community**

**anvil** **CrossCompute** **derwen.ai** **devrelia** **DigitalOcean**

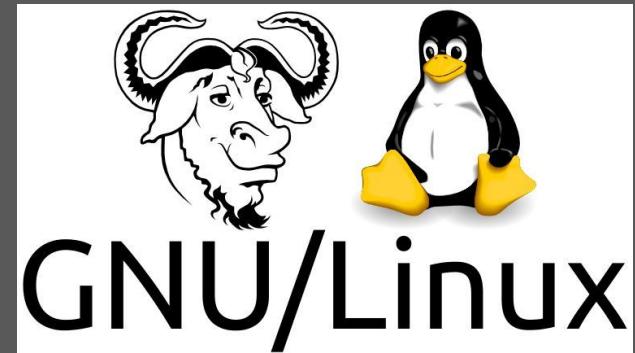
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**WordDocumenter** **XWiki**



# Free Software vs Open Source

- Free software origins (70-80s ~Stallman)
  - Cultish Political goal
  - Software part of free speech
    - free exchange, free modification
    - proprietary software is unethical
    - security, trust
  - GNU project, Linux, GPL license
- Open source (1998 ~ O'Reilly)
  - Rebranding without political legacy
  - Emphasis on internet and large dev./user involvement
  - Openness toward proprietary software/coexist
  - (Think: Netscape becoming Mozilla)



# Free Software vs Open Source

- 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.

## The Open Source Definition

free-redistribution

### Introduction

Open source doesn't just mean access to the source code. The distribution terms of open-source software must comply with the following criteria:

#### 1. Free Redistribution

The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale.

#### 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.

#### 3. Derived Works

The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.

#### 4. Integrity of The Author's Source Code

The license may restrict source-code from being distributed in modified form *only if* the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.

#### 5. No Discrimination Against Persons or Groups

The license must not discriminate against any person or group of persons.

#### 6. No Discrimination Against Fields of Endeavor

The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

#### 7. Distribution of License

The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.

# The Cathedral and the Bazaar



# All Our Patent Are Belong To You

Elon Musk, CEO • June 12, 2014

<https://www.tesla.com/blog/all-our-patent-are-belong-you>

Yesterday, there was a wall of Tesla patents in the lobby of our Palo Alto headquarters. That is no longer the case. They have been removed, in the spirit of the open source movement, for the advancement of electric vehicle technology.

Tesla Motors was created to accelerate the advent of sustainable transport. If we clear a path to the creation of compelling electric vehicles, but then lay intellectual property landmines behind us to inhibit others, we are acting in a manner contrary to that goal. Tesla will not initiate patent lawsuits against anyone who, in good faith, wants to use our technology.

When I started out with my first company, Zip2, I thought patents were a good thing and worked hard to obtain them. And maybe they were good long ago, but too often these days they serve merely to stifle progress, entrench the positions of giant corporations and enrich those in the legal profession, rather than the actual inventors. After Zip2, when I realized that receiving a patent really just meant that you bought a lottery ticket to a lawsuit, I avoided them whenever possible.

At Tesla, however, we felt compelled to create patents out of concern that the big car companies would copy our technology and then use their massive manufacturing, sales and marketing power to overwhelm Tesla. We couldn't have been more wrong. The unfortunate reality is the opposite: electric car programs (or programs for any vehicle that doesn't burn hydrocarbons) at the major manufacturers are small to non-existent, constituting an average of far less than 1% of their total vehicle sales.

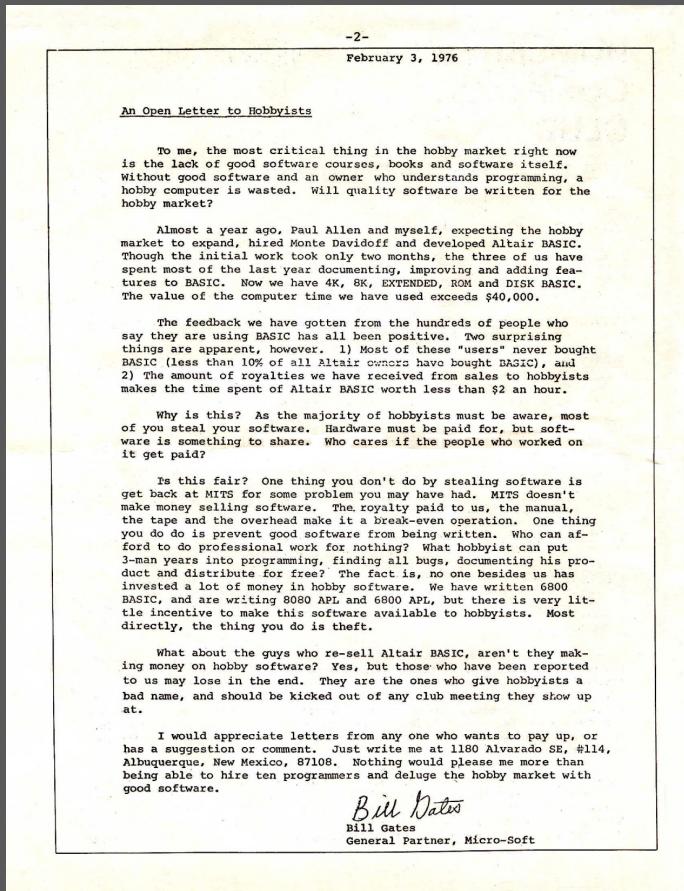
At best, the large automakers are producing electric cars with limited range in limited volume. Some produce no zero emission cars at all.

Given that annual new vehicle production is approaching 100 million per year and the global fleet is approximately 2 billion cars, it is impossible for Tesla to build electric cars fast enough to address the carbon crisis. By the same token, it means the market is enormous. Our true competition is not the small trickle of non-Tesla electric cars being produced, but rather the enormous flood of gasoline cars pouring out of the world's factories every day.

We believe that Tesla, other companies making electric cars, and the world would all benefit from a common, rapidly-evolving technology platform.

Technology leadership is not defined by patents, which history has repeatedly shown to be small protection indeed against a determined competitor, but rather by the ability of a company to attract and motivate the world's most talented engineers. We believe that applying the open source philosophy to our patents will strengthen rather than diminish Tesla's position in this regard.

# Tables have turned



## Redmond top man Satya Nadella: 'Microsoft LOVES Linux'

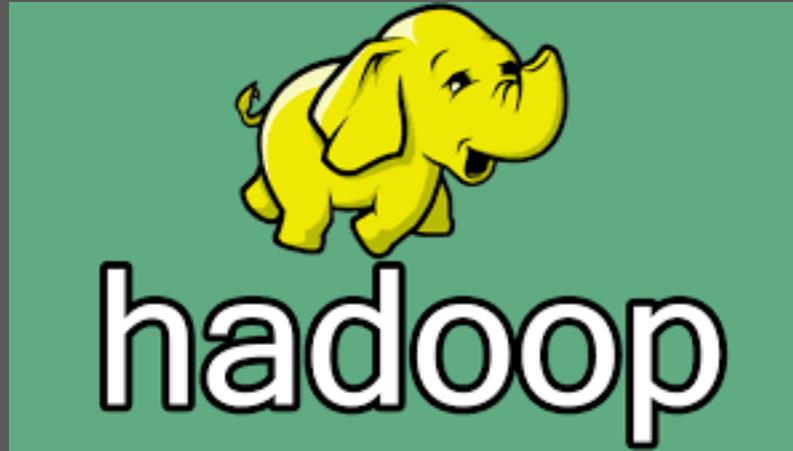
Open-source 'love' fairly runneth over at cloud event



20 Oct 2014 at 23:45, Neil McAllister



# Risks of *not* open sourcing something?



# UNDERSTANDING LICENSES

**NOTE: IANAL (I AM NOT A LAWYER)**

# Why learn about licenses?

- Companies will avoid certain licenses – commonly the copyleft licenses
- Specific licenses may provide competitive advantages
- You may eventually want to release open source software or become more involved in an open source project

# Open Source Licenses

Software	Percentage
MIT License	24%
GNU General Public License (GPL) 2.0	23%
Apache License 2.0	16%
GNU General Public License (GPL) 3.0	9%
BSD License 2.0 (3-clause, New or Revised) License	6%
GNU Lesser General Public License (LGPL) 2.1	5%
Artistic License (Perl)	4%
GNU Lesser General Public License (LGPL) 3.0	2%
Microsoft Public License	2%
Eclipse Public License	2%

List from: <https://www.blackducksoftware.com/resources/data/top-20-open-source-licenses>

# GNU General Public License: The Copyleft License

- Nobody should be restricted by the software they use. There are four freedoms that every user should have:
  - the freedom to use the software for any purpose,
  - the freedom to change the software to suit your needs,
  - the freedom to share the software with your friends and neighbors, and
  - the freedom to share the changes you make.
- Code must be made available
- Any modifications must be relicensed under the same license (copyleft)

# GPL 2.0 and 3.0 – Addresses free software problems

- 2.0 - Court ruling cannot nullify the license and if a court decision and this license contradict in distribution requirements, then the software cannot be distributed
- 3.0 – patent grant and prevent Tivoization
- Not compatible with each other; Can't copyleft both at the same time – phrase: "GLP Version 3 or any later version"

# Why would projects choose one license over another?

The screenshot shows a Microsoft PowerPoint presentation titled "OpenSourceLecture.pptx". The slide number is 33, and the title is "Why would projects choose one license over another?". Below the title is a link: <http://choosealicense.com/licenses/>.

The main content of the slide displays information from choosealicense.com about two licenses:

## Apache

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# Dual License Business Model



- Released as GPL which requires a company using the open source product to open source it's application
- Or companies can pay \$2,000 to \$10,000 annually to receive a copy of MySQL with a more business friendly license

# Risk: Incompatible Licenses

- Sun open sourced OpenOffice, but when Sun was acquired by Oracle, Oracle temporarily stopped the project.
- Many of the community contributors banded together and created LibreOffice
- Oracle eventually released OpenOffice to Apache
- LibreOffice changed the project license so LibreOffice can copy changes from OpenOffice but OpenOffice cannot do the same due to license conflicts

# MIT License

- Must retain copyright credit
- Software is provided as is
- Authors are not liable for software
- No other restrictions

# LGPL

- Software must be a library
- Similar to GPL but no copyleft requirement

# BSD License

- No liability and provided as is.
- Copyright statement must be included in source and binary
- The copyright holder does not endorse any extensions without explicit written consent

# Apache License

- Apache
  - Similar to GPL with a few differences
  - Not copyleft
  - Not required to distribute source code
  - Does not grant permission to use project's trademark
  - Does not require modifications to use the same license



Perception:

- Anarchy
- Demagoguery
- Ideology
- Altruism
- Many eyes