Free Software

Philosophy, history and practice

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GNU Project

Screencast version
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Introducing myself

I'm a computer scientist living and working somewhere around Paris...

...and a *GNU* maintainer.

I'm also an associate member of the *Free Software Foundation*, a fellow of the *Free Software Foundation Europe* and an *April* adherent.

So I'm **not** an impartial observer.

Contents

1. Introduction (and some quick reminders)
2. History and philosophy
   - The hacker community
   - The GNU Project and the Free Software movement
   - Linux and the Open Source movement
3. Legal aspects
   - Copyright
   - Free Software licenses

Reminders about software — source code vs. machine code

Source code vs. machine code

Quick demo

Reminders about software — linking

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We're gonna see that this has legal implications.

History of the Free Software movement — hackers

This story begins at the end of the 1970s at the *Artificial Intelligence Lab* of the Massachusetts Institute of Technology...

It was a community of *hackers*.

- By the way, the word "hacker" has been misused by the media: it does **not** imply breaking over network security. Hacking is "*playful cleverness*" [RMS]:
    - Finding unusual, creative solutions to computing problems
    - *"Hacker: A person who enjoys exploring the details of programmable systems and stretching their capabilities, as opposed to most users, who prefer to learn only the minimum necessary."* [the Jargon file]
    - An intriguing culture and mentality, not limited to computing. See for example [2]

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Richard Stallman was one of the hackers hired to work on the operating system.

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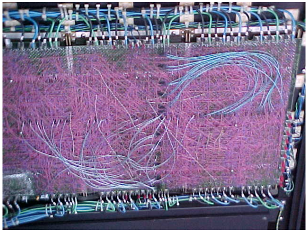
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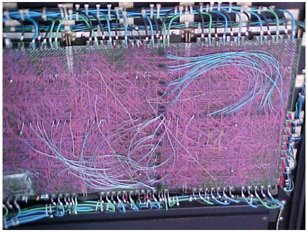
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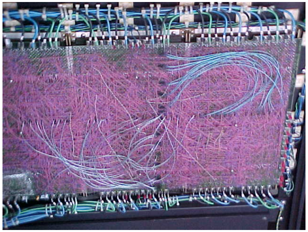
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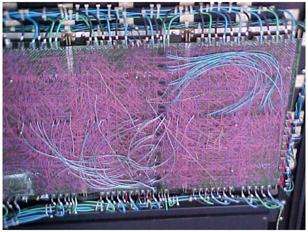
  - Macsyma
  - Scheme
  - ...



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(the driver problem was never solved)

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  - Lisp Machines Incorporated (Greenblatt)
  - Symbolics (Noftsker)

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- many lab hackers leave MIT for Symbolics
- Richard Stallman feels betrayed: he stays at MIT, and tries to *independently re-implement* Symbolics's software modifications for everybody to share, alone for two years (1982-1983)

Figure: Richard Stallman (in 2008)

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It's the final blow to what remains of the lab community.

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- portable
- compatible with Unix
    - good for technical reasons, and to make it easily accepted
    - very different from ITS
    - *no political reason for this choice*; Unix was proprietary

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- some people help, but most think the project is impossible. Stallman simply ignores the naysayers and goes on.
- He quits MIT and starts to work on GNU full-time. He sells copies of the already-written software and does consultancy work.

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Now there are several successful examples of commercial free software companies.

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- *no GNU kernel yet*

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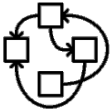
1991: the GNU kernel, *"the Hurd"* is started by Michael (later Thomas) Bushnell



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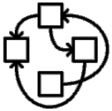

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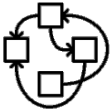

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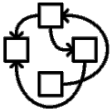

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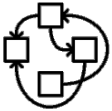

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  - a multi-server operating system is *very* hard to debug

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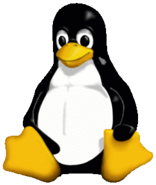

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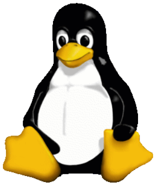
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- Linux works with the GNU system: a complete free software operating system now finally exists...

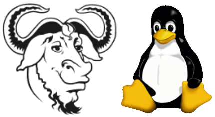
Figure: GNU + Linux

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- Linus a good communicator, and his project becomes much more visible than GNU.
- The GNU/Linux system is a success, but people are not exposed to the political message of free software any more. Most new users even ignore GNU's existence.

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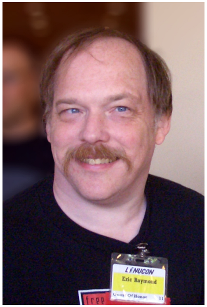
- GNU/Linux becomes a strong competitor against proprietary operating system
- *Proprietary applications* are ported to the system.

1998: The Open Source Movement (1)

- 1998: Eric S. Raymond, long time Emacs contributor, urges people to rename “Free Software” into “Open Source”.
- *No references to freedom*: Stallman’s strongly political message “scares away investors”



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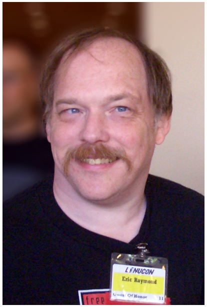
- *No references to freedom*: Stallman's strongly political message "scares away investors"
- The Open Source movement does not consider proprietary software an ethical problem. Open Source software is preferred *just because of practical reasons*:
  - It's flexible and tends to be of better quality
  - It's frequently gratis



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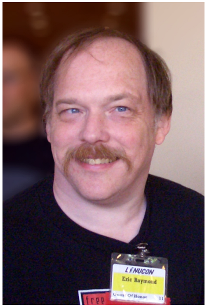

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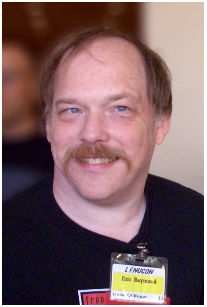

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- Raymond and other Open Source advocates contribute a lot to "software engineering" in the distributed model of the Internet; yet they don't see proprietary software as a problem
- Stallman and other Free Software advocates strongly react to such an a-political stance and distance themselves, but they have become a minority

Figure: Richard Stallman

Free Software and Open Source

- The two movements consider Free Software / Open Source essentially *the same set of programs*
  - the Open Source definition is formulated differently, but in practical terms it describes almost the same set of software as the Free Software definition
  - almost the same set of licenses!
- Very different philosophies, but there is frequent cooperation
  - often contributors *in the same project* have different views
- The Free Software movement is regaining visibility (but it needs your support)
- Free/Open Source projects continue to grow in number

Legal aspects

Warning: I'm not a lawyer!

"Intellectual property"

In the Free Software movement we're against using the term "Intellectual property": it confuses very different aspects and laws, and wrongly suggests that abstract entities should be treated like material objects.

- Trademark
- Copyright
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Copyright, in general (2)

Copyright is obtained *automatically*. Writing a copyright notice like

Copyright © 2012, Jacques Lefevre

may make the situation more clear, but is no longer mandatory.

In France and some other countries you can *register* your work at a government agency just to make it easier to prove your autorship in the future, but it is *not required*.
[Perversely, in France this agency is a *private* entity. Look for "APP", Agence de Protection des Programmes]

Copyright for software

Software is treated *like a literary work*. In Computer Science terms we're concerned about copies of some "string of text", be it source or binary, of some significant length (often one says over 15 source lines, but that's just a guideline).

In practice how complex the code is, or the algorithm employed, doesn't matter: we speak about "text".

In France by default a work's copyright is held by *the author's employer* if the work is part of the author's job.

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- So *as a practical, a posteriori guideline* the address space seems to be the "barrier" (calling the kernel is not "linking", for example).

Licenses

With a **license** an author permits somebody else to perform some activities on which he/she has a monopoly by default (for example, making copies), at some conditions.

License notices in source files tend to look like:

```
/* Copyright (C) 2012, Jacques Lefevre
   This work is licensed under the Foo license.
   See the file COPYING for the full license text. */
```

Within comments, at the beginning of files.

License compatibility

When you link two pieces of software, you have to respect both their licenses.

If one license requires to do something forbidden by the other one, *you can't link the two pieces of software*.

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- That's **one** reason why inventing new licenses tends to be a bad idea

Free Software licenses

Very simply, a piece of sofware is free software for you if its license grants you all four freedoms 0..3.

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- Many commonly-used licenses allow you to do that

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- A subversive hack on the legal system [RMS]

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- Weak copyleft: GNU LGPL
- No copyleft: X11, BSD (both versions, but the older one is GPL-incompatible so please don't use it)

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A final word

Thank you.

And thanks to the hosting organization for the opportunity of giving this slightly subversive talk.

In case you're interested in contacting me:

positron@gnu.org
http://ageinghacker.net

I made some changes suggested by Ludovic Courtès and José Marchesi in Summer 2012. Thanks!

For more information I

- Richard M. Stallman
  Free Software, Free Society: Selected Essays of Richard M. Stallman
  GNU Press, Boston, 2002
  also freely downloadable from the Net
- Steven Levy
  Hackers: Heroes of the Computer Revolution
  ISBN 0-385-19195-2, Anchor Press/Doubleday, 1984
  about the early history of hacker culture and communities, written by an outsider

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