

Free and Open Source Software



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About Myself

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Gentoo

- A metadistribution founded in 1999 by Daniel Robbins
- Can run other kernels besides Linux
- Source based distribution
- Rolling releases
- Extremely customizable



Free Software

- <http://www.gnu.org/philosophy/free-sw.html>
- A program is free software if the program's users have the four essential freedoms



Freedom 0

- “The freedom to run the program, for any purpose”
- So this for example includes:
 - Commercial purposes
 - Activities the author does not agree with



Freedom 1

- “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 to this.”



Freedom 2

- “The freedom to distribute copies so you can help your neighbor.”



Freedom 3

- “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 to this.”



Open Source Software

- <http://opensource.org/docs/osd>
- 10 criteria for distribution terms:
 - Free Redistribution
 - Source Code
 - Derived Works
 - Integrity of the Author's Source Code
 - No Discrimination Against Persons or Groups
 - No Discrimination Against Fields of Endeavor
 - Distribution of License
 - License Must Not be Specific to a Product
 - License Must Not Restrict Other Software
 - License Must Be Technology-Neutral



Free vs. Open Source Software

- Idealism meets pragmatism
- Linus Torvalds vs. Richard Stallman



Richard Stallman
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GPL-3

- No way to get it to fit here
- Shows how licenses vary from very simple to complex legal documents depending on the needs
- Viral license



Legal Basis

- Copyright law
- Trademark law
- International treaties provide for similarities around the globe
- Course Tietotekniikkaoikeus is great



Where is open source?

- Short answer: everywhere
- Android has the Linux kernel so there should be quite a few Linux kernel running this very moment
- Server software



How to make money with open source?

- Selling support
 - Red Hat
- Building services on top
 - Facebook
 - Google
- Open source does not prevent you from making money



How I use open source?

- Mozilla Firefox etc. utility software
- Gentoo Linux Desktop
- Building Web Applications



How do Open Source Projects Get Started?

- Someone has an itch to scratch
 - Linus wanted to replace the existing source control management system
 - Git was born
- Companies open source their proprietary code bases
 - Mozilla



What can one do to help?

- Report bugs
- Write documentation
- Write translations
- Provide user support
- Write code
- It's a group effort



How to provide code?

- You have a bug to solve
- Find where the code lives
 - For example github
- Get the source locally
- Run test suite
- Modify the source to fix the bugs
- Make sure tests pass
- Send the modifications back



Software Engineering Practices in Open Source



Quality Assurance

- “Given enough eyeballs, all bugs are shallow”
 - <http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/>
 - Eric Raymond – The Cathedral and the Bazaar



Backlog Management

- Usually there's very little towards a backlog that anyone would maintain for future work items
- Bug trackers do exist that can also include improvement ideas



The Cathedral and The Bazaar

- The Cathedral
 - Code available with each release, otherwise restricted
- The Bazaar
 - Done in the open



Project Management

- Usually no formal organizations
- Layered structure
- Meritocracy



Open Source Software Provided by Soberit

- Agilefant
 - [Www.agilefant.org](http://www.agilefant.org)
 - Backlog management tool
- ARCA-Tool
 - Root cause Analysis tool
 - <http://wirca.soberit.hut.fi/prod/>



Look in practise

- Github
- Travis CI
- Gentoo bug tracker
- Kernel mailing lists



Open Source and Science



Mining Repositories

- The bazaar is easy to analyze
- Mining software repositories is a dedicated field
- Example paper:

Torres, M.R.M.; Toral, S.L.; Perales, M.; Barrero, F., "Analysis of the Core Team Role in Open Source Communities," *Complex, Intelligent and Software Intensive Systems (CISIS)*, 2011 International Conference on , vol., no., pp.109,114, June 30 2011-July 2 2011



Social Network Analysis

- When the interactions are available they can be looked at the and correlated with for example bug metrics

Roberto Abreu and Rahul Premraj. 2009. How developer communication frequency relates to bug introducing changes. In *Proceedings of the joint international and annual ERCIM workshops on Principles of software evolution (IWPSE) and software evolution (Evol) workshops (IWPSE-Evol '09)*. ACM, New York, NY, USA, 153-158



How to meet people?

- Conferences like FOSDEM
 - Free entrance
 - Every year in Brussels



Questions & Discussion

