An Introduction to FOSS

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What is FOSS?

- Free and Open Source Software
  - What does 'free' mean?
  - Does providing source make it Open Source?
  - Who makes FOSS? Why do they do it?
  - Is FOSS just for fanatics and hobbyists?
  - Can you make money with FOSS?
  - Does FOSS make for better software?
  - How do FOSS developers collaborate?
  - How is FOSS tested?

The many facets of FOSS

- FOSS is different things to different people
    - Some see it as a resource
    - Some see it as an ethical choice
    - Some see it as a technical choice
    - Some see it as the enemy
    - Some see it as just another type of software

Free as in Freedom

"Free software" is a matter of liberty, not price. To understand the concept, you should think of "free" as in "free speech," not as in "free beer"

(Richard Stallman, The Free Software Definition)

The Four Freedoms

   * *The freedom to run the program, for any purpose (freedom 0).*
   * *The freedom to study how the program works, and adapt it to your needs (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 improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits (freedom 3). Access to the source code is a precondition for this.*

(Richard Stallman, The Free Software Definition)

How big is FOSS?

- How many projects?
  - Certainly in 100s of thousands
  - Over 400,000 projects registered on one site alone (sourceforge.net)
  - Similar number of developers?

- How many users?
  - Depends on what you call a 'user' !
  - Certainly many millions

- What types of products?
  - Not just for servers and desktops
  - Huge presence in embedded market

FOSS Community

- Developer community
    - Each FOSS project develops its own sub-culture
    - Most have common elements

- Some common factors
    - Strong leaning towards meritocracy
    - Right to fork, but reluctance to fork
    - Technical focus
    - Openness in communication

How I got started in FOSS

- Scratching an itch
  - physics student at ANU – contributed to NCSA telnet
  - during PhD in CS started contributing to more projects
  - started around 20 new FOSS projects over 8 years
  - started Samba project in December 1991
  - started paid FOSS development in 2000
  - worked for Linuxcare, Snap, Quantum, VA and IBM
  - now doing development of open source autopilots

Some FOSS Projects I've worked on

- Samba – file/print/auth server
- rsync – efficient file transfer
- APM – autopilot software
- SiK – radio firmware
- jitterbug – bug tracking system
- KnightCap – chess program
- tdb – a tiny database
- ccache – compiler cache
- rzip – file compression
- EVACS – ACT electronic voting system

Why you should get involved

- Best job training
  - Gain experience with top software developers
  - Prove what you can do to potential employers
  - Exposure to a huge variety of engineering methods
- Great communities
  - Highly technical communities, where the best code wins
  - A lot of fun!

How to get started

- Finding a project
  - Look on sites like sourceforge.net and freecode.com
  - Find a project that has good resources for new developers
  - Make sure the project is active – check that it has several active developers
  - Pick a project that you are excited about
  - Read the developer documentation carefully! Read the mailing list archives
  - If in doubt, a game is often a good choice for a first project

- More into hardware?
  - Join a makers group, like makehackvoid in Canberra
  - learn about Arduino, and related robotics projects

Languages and Toolkits

- There are FOSS implementations of nearly every programming language
  - choose the one that suits your project!
  - python and ruby are great general purpose choices
  - jQuery is a great choice for web development
  - arduino can be great to get into robotics
  - Java and Scala for Android development

Building with FOSS

- Let's look at a recent project
  - http://weather.cmac.org.au
  - a FOSS based remote weather station
  - built on a RaspberryPI running Debian Linux
  - python scripts to create the website
  - rsync to transfer data
  - bash scripts for camera control
  - ffmpeg to create timelapse videos
  - Hame router (Linux based) for wireless interface

More information

- COMP8440: http://cs.anu.edu.au/student/comp8440/

- Free Software Foundation: http://fsf.org

- GNU Project: http://gnu.org

- Sourceforge: http://sf.net

- FreeCode: http://freecode.com

- Python: http://python.org

- Arduino: http://arduino.cc