When Open Source Hardware
Fall in love with Fedora

Presented by
Tong Hui
Open Source Evangelist of DFRobot

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About Tong Hui

- Open Source Evangelist @ DFRobot
- Open Source Embedded Mentor
- Embedded Mentor at AKAEDU
- Embedded Engineer

FAS: Tonghuix
Weibo: http://weibo.com/tonghuix
Twitter: @tonghuix
Website: http://tonghuix.tk
Blog: http://tonghuix.blogspot.com
Agenda

- What is Open Source Hardware (OSHW)
- Developing OSHW in Fedora
  - Arduino
  - ARM-based Chips
  - Embedded Linux
- Good News for Fedora
- Plans and Hopes
- Q & A
What is Open Source Hardware (OSHW)?
Open Source Hardware

- Based on Open Source Software idea
  - Mechanical drawings
  - Schematics
  - BOM table
  - PCB layout
  - HDL layout
  - .......

- One of open source culture movement
- License – Most of FOSS are suitable OSHW
Some OSHW projects

- Arduino
- RepRap – 3D Printer
- OpenSPARC / OpenRISC
- OpenMoko / GTA04
- Open Embedded / Yocto
My Contributing Projects

- OpenDrone Quadcopter
  - [www.open-drone.org](http://www.open-drone.org)
- FlyMaple – forked from “Leaflabs Maple”
  - ARM Cortex-M, STM32 Boards
- Dreamer MEGA - Arduino-based Boards
Development
OSHW in Fedora
Needed

- Software
  - PCB (KiCAD, gEDA, Eagle)
  - CAD (FreeCAD, Blender)
  - Cross Compile Toolchain
  - Arduino IDE
  - Fritzing

- Hardware
  - Arduino
  - Beagleboard / Pandaboard
  - Raspberry Pi
  - Cubieboard
Play Arduino in Fedora

- Install Arduino IDE
  ```bash
yum install arduino
  ```
- Add user to plugdev and dialout group
- All Done, Play now!
ARM MCU or Bare Development

Suggestions

- ARM Cross Compile Toolchain (linaro)
- JTAG/SWD Debugger (OpenJTAG)
- OpenOCD
- Leaflabs Maple (STM32 Boards, MCU)
- Oscilloscope (Xoscope)
- Qemu
Demo: Flymaple

Flymaple, A flight controller with 10 DOF IMU, based on STM32F103. It forks from “Leaflabs Maple”, use same Maple IDE, and supported Arduino pin-out and API.

- Install Maple IDE – Download it from Leaflab.com
- Or install toolchain manually
  http://www.open-drone.org/develop_flymaple_in_unix_toolchain
- All done, and Play!
Embedded Linux

- Kernel Limitation for closed platform (R Pi)
- Please focus:
  - Yocto Project – Hosts by Linux Foundation
  - Tizen Project – Hosts by Linux Foundation
  - Open Embedded
  - OpenWRT – router os
  - OLPC Tablet
  - Fedora for ARM / Ubuntu for ARM / OpenSUSE for ARM
Fedora ARM

- Includes support for Beagleboard-xM, Dreamplug, Guruplug, Highbank, iMX, Pandaboard, Sheevaplug, Trimslice, Versatile Express(QEMU) and more!
- IRC: #fedora-arm @ Freenode
- Maillist: arm@lists.fedoraproject.org
- Cubieboard Fedora ARM distribution
- Raspberry Pi Fedora Remix
Plans and Future
Plans

- Fedora 19 will support 3D-Printing!
  - https://fedoraproject.org/wiki/Features/3D_Printing
- Fedora 18 could run Cura 12.12, more test is needed.
  - http://daid.github.com/Cura/
- OpenDrone will package Flymaple SDK in RPM
- OpenDrone will release Quadcopter
Open Source Hardware Future

- License is needed – now shared FOSS licenses GPL, MIT, Apache and Creative Commons
- Embedded Devices supporting more widely (Linux, Mac OS X and Win)
- MCU Development easier than before
- More Commercial Applications – from DIYer to Business
- Back to “MIT Hacker Age”...
Questions?

Contact: tonghuix@gmail.com

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Happy Hacking!
Happy Chinese New Year!