FOSS & Industry

A Perspective from Ettus Research

Ben Hilburn

Engineering Manager, Ettus Research

NATIONAL
INSTRUMENTS™

Before we get started…

- I'm not a lawyer.

- I'm not a FOSS zealot. I'm not here to convince you that FOSS is the solution to everything in industry.

- FOSS can provide a lot of value to your company and to your customers.
  - My goal is to give you some insight into how hardware designers and vendors can benefit from FOSS.
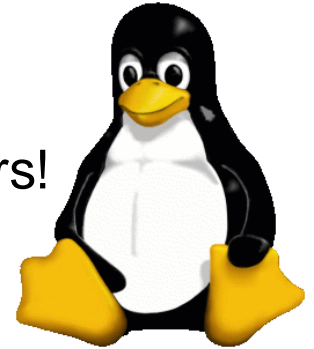
- No, seriously, I'm not a lawyer.

NATIONAL INSTRUMENTS™

Topics

1. Ettus Research and FOSS
2. Benefits to Customers
3. Benefits to Ettus Research
4. Which issues are FUD, and which are real?

NATIONAL INSTRUMENTS™

Topics

1. **Ettus Research and FOSS**
2. Benefits to Customers
3. Benefits to Ettus Research
4. Which issues are FUD, and which are real?

NATIONAL INSTRUMENTS

FOSS that Ettus Research Participates In

- Well, for starters, R&D develops in Linux.
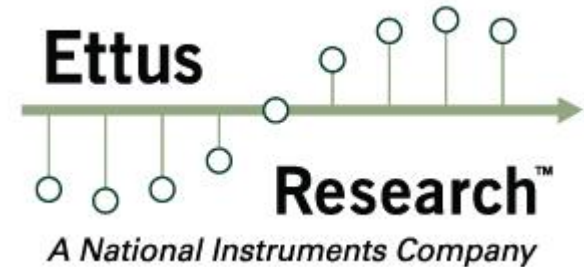 - We also upstream certain embedded hardware drivers!

- GNU Radio
  - Ettus Research is a key member of the GNU Radio community
  - Used heavily by Ettus for product development.
  - Used heavily by customers for radio applications.
  - Matt Ettus one of the founding developers.

- OpenEmbedded
  - Used heavily by Ettus for embedded development.
  - Used by some customers for custom embedded distros

FOSS Owned by Ettus Research

- ## USRP Hardware Driver (UHD)
  - Driver for **all** Ettus Research products
  - https://github.com/EttusResearch/uhd
  - C++, C, Verilog, assorted assembly
  - GPL v3+

- ## RF Network-on-Chip (RFNoC)
  - Data-flow framework for distributed heterogeneous processing
  - UHD, GNU Radio, Verilog
  - GPL v3+

- ## GNU Radio modules (`gr-uhd`, `gr-ettus`)

- ## Various Repositories for OpenEmbedded toolflow

Topics

1. Ettus Research and FOSS
2. **Benefits to Customers**
3. Benefits to Ettus Research
4. Which issues are FUD, and which are real?

NATIONAL INSTRUMENTS

Customers and FOSS Drivers (UHD)

- Full access to the source engenders trust
  - Nothing to 'hide' in the drivers.
- Enables customers to customize and tweak the driver to their specialized needs
  - "I know I have the information I need to make it work."
- Makes it easier for customers to get technical support because they can be a part of the debug process
  - "My program crashed. Here is a backtrace. Can you help?"
- Customers have access to a community
  - "Someone else made a good starting point for me to build on."
  - "Is there someone out there also solving this problem?"

NATIONAL INSTRUMENTS™

Customers and FOSS Tools (GR, RFNoC)

- Access to the community is **huge** for tools & applications
  - Existing implementations, examples, papers, blogs, etc.,
  - Customers don't have to "re-invent the wheel".
  - Access to support list / forum and archives (answered questions)
  - Can influence direction of development and new features
  - Provides a 'safety net' for customers when they get stuck
- Access to the developers
  - `git` lets you do this on a line-by-line basis!
- Able to implement new features / modules
  - This is made much simpler simply by being FOSS
  - Opens door to benefits of upstreaming (more on this later)
- Very compelling price per seat!

NATIONAL INSTRUMENTS™

Topics

1. Ettus Research and FOSS
2. Benefits to Customers
3. **Benefits to Ettus Research**
4. Which issues are FUD, and which are real?

**NATIONAL
INSTRUMENTS™**

How does Ettus Research benefit?

- Build community around our own products
    - Your best sales team is your customer community
    - A vibrant community is an indicator of current and future success
    - Gives you insight into new markets and business direction
    - Your community is a positive feedback loop for support / help

- Find customers.
    - Smart customers who understand the product space
    - Smart customers who know how to ask for help
    - Smart customers who are going to do awesome things

- Make new business connections

NATIONAL INSTRUMENTS™

How does Ettus Research benefit? (part 2)

- Developers, developers, developers!
  - Find top-tier developer talent.
  - Develop your existing talent
    - Contributing code to FOSS can be arduous.
- Don't have to re-invent the wheel
- Upstreaming drivers / features / bug fixes is amazing
  - Lots of maintenance happens for you!
  - Your code will be 'ubiquitous' in distributions.
  - Code quality.
- Distribution installers / package management
- The OSS model of development is good for quality

Topics

1. Ettus Research and FOSS
2. Benefits to Customers
3. Benefits to Ettus Research
4. Which issues are FUD, and which are real?

NATIONAL INSTRUMENTS™

15

NATIONAL INSTRUMENTS

Issue: FOSS is never as good as proprietary.

Real or FUD

?

NATIONAL INSTRUMENTS™

Issue: FOSS is never as good as proprietary.

- "If it was any good, someone would be selling it."
  - Just flat not true.

- Plenty of great FOSS, plenty of terrible FOSS
  - Basically same boat as proprietary software

- Clang, git, valgrind, qemu, fftw, apache & nginx, ssh
- Linux.

NATIONAL INSTRUMENTS™

Issue: FOSS Infects Everything!

Real or FUD

?

NATIONAL
INSTRUMENTS™

~~Issue #7: OSS~~ FUD Infects Everything!

- There are two major parts to this discussion:
  - License selection ('copyleft')
  - Copyright vs License

- As the copyright owner of the software, you can license the software to anyone under any license you choose.

- Even in a copyleft scenario, it only affects software you **distribute** (i.e., give / sell to outside parties).
  - Anything you do internally remains internal.

NATIONAL INSTRUMENTS™

Issue: Accepting & Pushing Contributions

Real or FUD

?

NATIONAL INSTRUMENTS™

Issue: Accepting & Pushing Contributions

- For projects that are under more than one license, some complexity exists here.

- Option #1: Contributor License Agreement (CLA)
  - Author retains copyright, but gives you unlimited license.

- Option #2: Copyright Assignment
  - Employer must be cool with this.
  - Model the FSF uses.

NATIONAL INSTRUMENTS™

Issue: But I lose my competitive advantage!

Real or FUD

?

NATIONAL INSTRUMENTS™

Issue: It's my competitive advantage!

Sometimes FUD

- Probably true in some scenarios

- …but probably not in as many scenarios as you think

- Need to weigh this on a case-by-case basis
- This is a business decision only you can make

- Must be comfortable with the consequences of someone else making an implementation open before you

NATIONAL INSTRUMENTS™

Topics

1. Ettus Research and FOSS
2. Benefits to Customers
3. Benefits to Ettus Research
4. Which issues are FUD, and which are real?

5. **Conclusion**

Conclusion

- The future will have a lot more open source
  - Microsoft open-sourcing .NET
  - REDHAWK getting open-sourced.

- Open Source can bring a lot of value to you and your customers

- Ultimately, open sourcing your software is a business decision only you can make.

NATIONAL INSTRUMENTS™