Open Source Hardware
An introduction

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1 Logistics
2 What is OSHW?
3 Why OSHW?
4 How to do OSHW?
5 Conclusions
Outline

1. Logistics
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3. Why OSHW?
4. How to do OSHW?
5. Conclusions
Logistics

Wireless Internet access
Login: visitor
Password: ICALEPCS

Keep it informal but...
- Wait for the end of talks, the breaks or the discussion session to ask questions.
- Take the mic to talk.
- Respect vendor stands and tables during coffee and lunch breaks.
There is an OSHW definition!

Check out [http://freedomdefined.org/OSHW](http://freedomdefined.org/OSHW)
- Made by the same people who organize the OH Summit. See Tom’s talk.
- Inspired by the Open Source definition for software.
- Focuses on ensuring freedom to study, modify, distribute, make and sell designs or hardware based on those designs.
- Now we know exactly what we mean when we say OSHW!

There are licences compatible with it
- E.g. CERN Open Hardware Licence. But there are others, like TAPR OHL and the CC family.
- See Myriam’s talk.
There are many successful OSHW projects

Arduino is probably the best known
- Huge community.
- A source of inspiration for many people.
- See David’s talk.

Designs hosted in www.ohwr.org
- See Erik’s talk on CERN designs.
- See Brandon’s talk on Rhino.

And many many others... (see e.g. Pascale’s talk on Soleil designs).
Many companies already do it

Have designed OSHW
- Creotech (see Greg’s presentation).
- Seven Solutions (see Eduardo’s presentation).
- Facebook (see John’s presentation).

Are seriously considering it
- National Instruments (see Ravi’s presentation).
- I-Tech (see Borut’s presentation).

And many many others...
Reasons for OSHW (designers)

Avoid duplication
How many people are designing a 100 MS/s ADC board just in the ICALEPCS community right now?

Get peer review and help
- From companies.
- From colleagues in other labs and universities.
- From great people you don’t know!

Tackle more ambitious projects
Imagine what the people in this room could do if working together. And that’s very few people!
### Reasons for OSHW (companies)

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<td><strong>Peer review</strong></td>
<td>Have other people, including your clients, help you in the design. Compensate your weak areas with external help.</td>
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<td><strong>Lower entry barriers</strong></td>
<td>Enter a new market with almost no risk.</td>
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<td><strong>Build hybrid solutions</strong></td>
<td>Complement your proprietary product line with OSHW gear and sell complete integrated systems.</td>
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Reasons for OSHW (clients)

No vendor lock-in, resulting in

- Vendors selected solely on their proficiency and quality of support.
- Reasonable prices.
- Easier management of obsolescence.
Put your stuff online!

E.g. in the Open Hardware Repository

- A complete web-based collaborative environment made of FOSS itself.
- Best practice is to make it much more than a dump for design files: explanations, specifications, mailing list discussions...
- Version control for code (HDL, firmware...) but also for schematics, PCB layout, etc.
Use an OSHW definition-compliant licence

E.g. the CERN OHL

- Give lots of freedom to licensees.
- Ensure modifications are fed back to the community.
- Deal properly with liability.
Try to use FOSS tools for development

For gateware
- Simulation: Icarus Verilog, GHDL... See Pawel’s talks.
- Synthesis and P&R?! See Sebastien’s talk.

For PCB design
- gEDA: see Larry’s presentation.
- Kicad: see Dick’s presentation.
- Are we there yet? See Tom’s presentation.
Find a good commercial model

Companies are your friends

- Expertise.
- Guarantee.
- Support.
- All these things are worth money! Can we change our mindset?
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Some remarks before moving on

- Don’t hesitate to challenge, ask, discuss... This is a workshop, on a very new paradigm.
- Have fun!