How to leverage Open-Source in industry ?

Thales DIS - Jean-Roch COULON

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Acknowledgements

Some Thales contributions to CVA6 are supported by the **TRISTAN** and **ISOLDE** projects, which have received funding from the Chips Joint Undertaking (Chips JU), Austria, Belgium, Czechia, Finland, France, Germany, Italy, the Netherlands, Poland, Romania, Sweden, Switzerland, Spain and Turkey under grant agreements 101095947 and 101112274. The JU receives support from the European Union's Horizon Europe research and innovation program.

This work was supported by the **SPIRS** Project with Grant Agreement No. 952622 1086 under the EU H2020 research and innovation program.

Some Thales contributions to CVA6 are supported by the **IPCUBE** project which has received from the France 2030 under grant agreement No DOS0208495/00 DOS0208496/00.

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What is Open-Source ?

Development strategy:
Roadmap

Specifications

Best in class HW architects :
OpenHWgroup meetings, multi organizations

Source code :
RTL, C code

Resource sharing

Verification:
Testbench, tests

Easy communication
No NDA, permissive license

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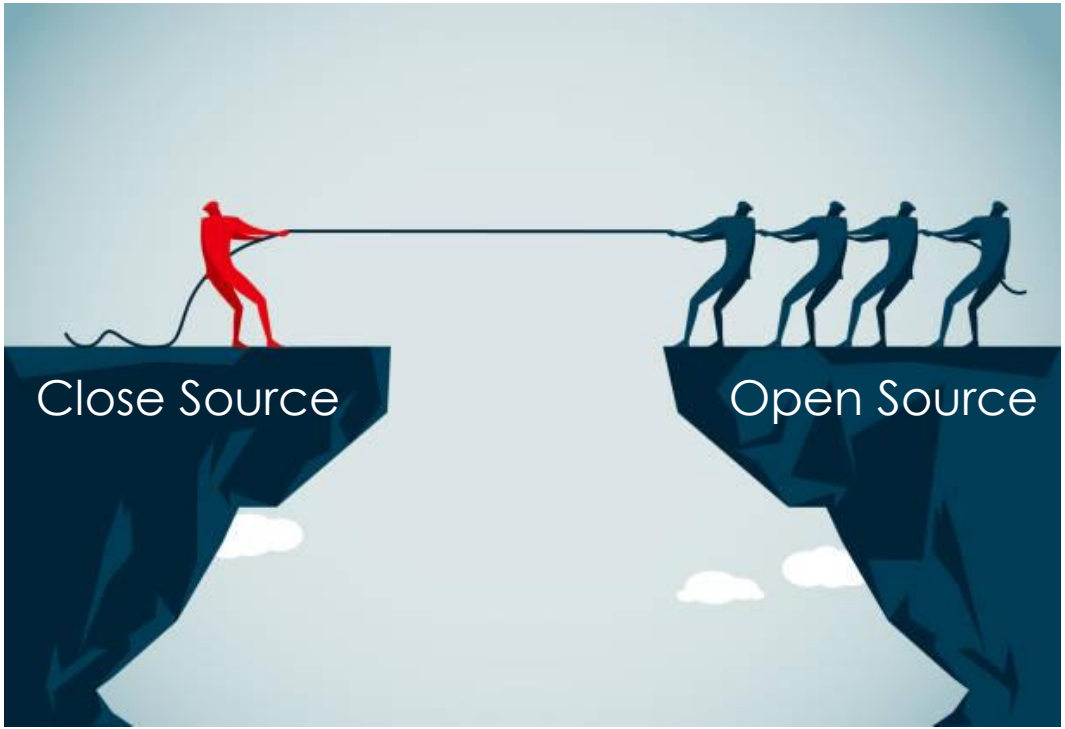
Unfair competition



- ✓Development is faster
- ✓Quality and performance are higher
- ✓Contributor recognition is great

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Why Open-Source hardware is behind software ?

Open Source Software is « code »

Open Source Hardware is « RTL code + tools + verification »

GitHub https://github.com/openhwgroup/cva6 is complete, compatible with industrial needs

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CVA6 ecosystem

> Thales leads the CVA6 core project at the OpenHW Group

> Over four years, a vivid ecosystem has expanded around CVA6, with several OpenHW projects

CVA6 OpenHW+TRISTAN workshop, January 2024

Contributors to CVA6 OpenHW ecosystem

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CVA6 contribution gifts

2021
CV-X-IF

2022
Bit Manip

2022
FPGA optim.

2023
Yocto Linux

2022
Vector

2021
32b version (CV32A6)

2023
Hypervisor

Legacy
OpenPiton

2024
HPDCache

Legacy
ARIANE (64b)

2024
Spike tandem

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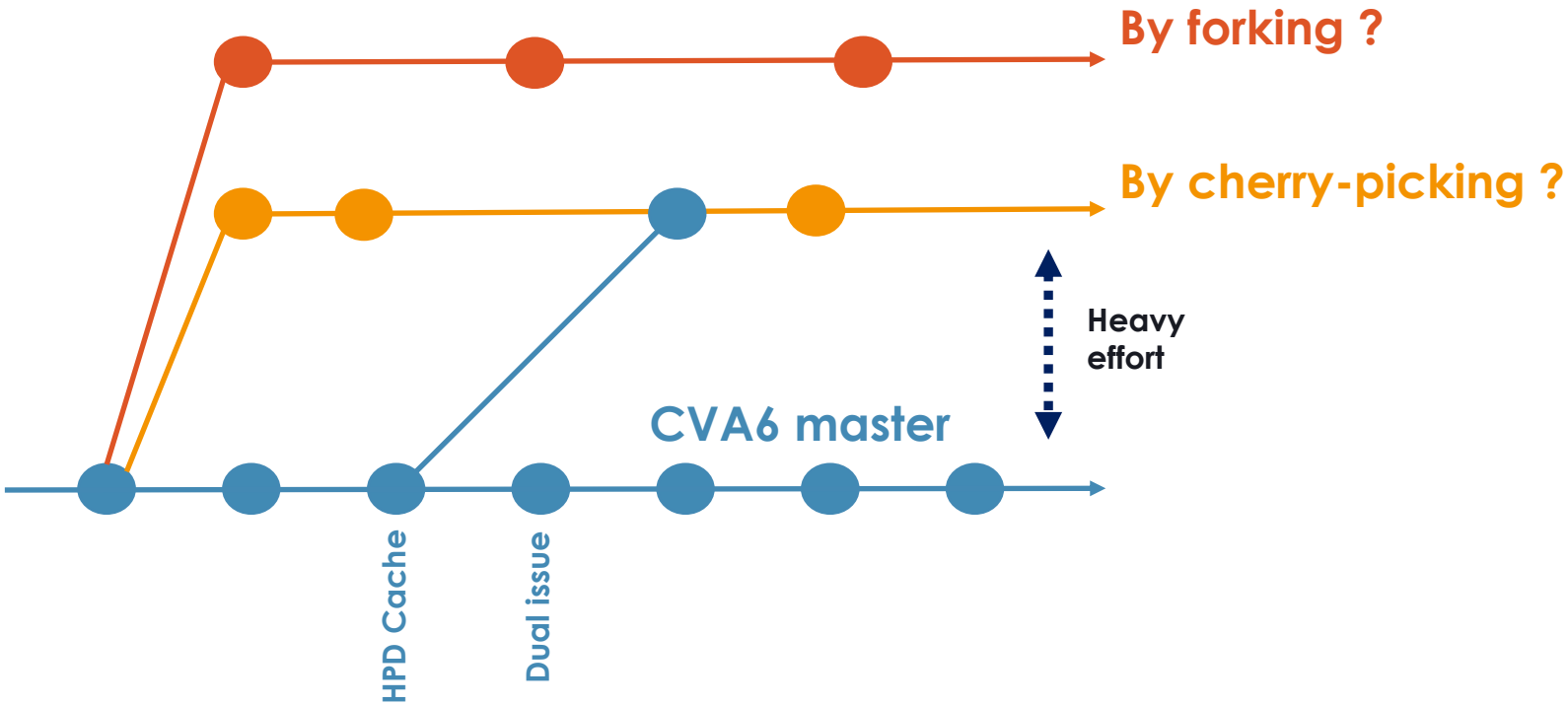
Open-Source challenges

1. How to leverage Open-Source ?
2. Code integrity and quality
3. Intellectual Property protection
4. Code exploitation

How to leverage Open-Source ?



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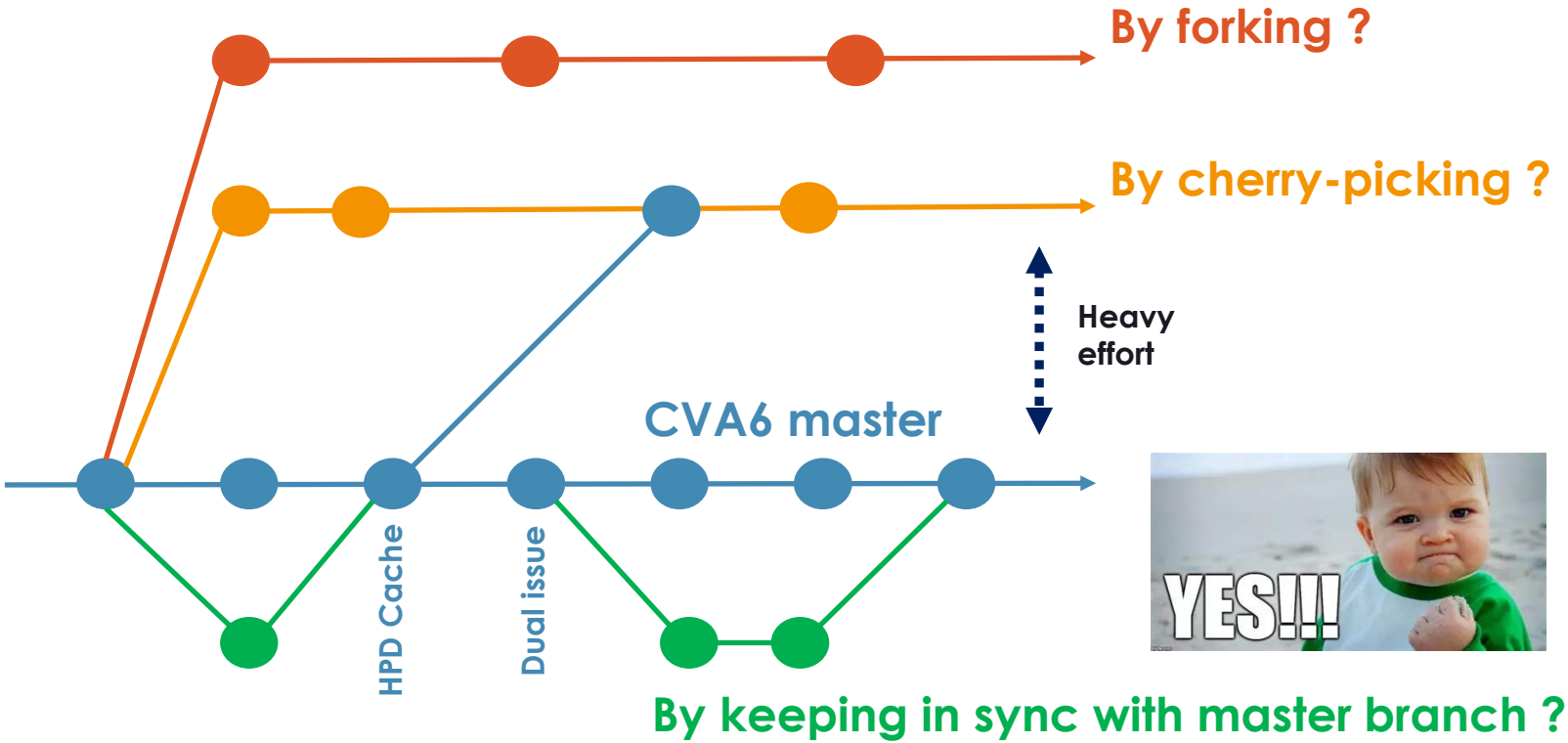
How to leverage Open-Source ?



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Code integrity and quality

Solutions

- ✓ Code review
- ✓ Code & Functional coverage
- ✓ Continuous integration

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IP protection

Needs:
- Implement IP in products to be eligible to certifications

Threats:
- IP disclosure

Solutions

✓ Open Source customization with Thales internal assets

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Code exploitation

Needs:

- To remain master of our choices
- To be able to exploit the code

Threats:

- Agreement on roadmap with other organizations
- Exportation rights

Solutions

- ✓ Leading Open-Source working groups and being committer
- ✓ Use Open-Source to avoid export rights

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My takes to leverage Open-Source

1. Commit technical code outside your private IP
2. Extend the Open-Source code with your assets
3. Commit RTL, tools and verification
4. Keep in sync with master branch
5. Support Open-Source governance and develop the community

Open-Source Code

Assets

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Thank you

Jean-Roch Coulon

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