Cloud-V: Becoming the first official RISC-V Lab Partner
(and how you can become one as well!)

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Abstract

What is RISC-V Labs? We will be introducing the RISC-V Labs Initiative as an interest group within RISC-V International & how Cloud-V became the **World's First Official RISC-V Lab Partner.** We will show what we have done so far and how RISC-V Labs offers an opportunity for the RISC-V open source software community now and in the future.

Background

RISC-V is attracting a lot of attention in today's semiconductor industry as an open standard and there is also progress in hardware optimization of RISC-V. But the software side of RISC-V still has lots of work to do. To build the RISC-V software ecosystem there is a need to motivate software developers to develop software or port existing software to RISC-V. As long as there is no hardware available in the ecosystem to work with, software developers will be reluctant to move towards developing software for RISC-V.

The hurdle is to have the environment set up correctly for software developers to seamlessly start RISC-V software development. This includes vendor-agnostic libraries and specific versions of various dependencies, many of which may not be ported to RISC-V. To overcome these challenges, there is a need for a platform that has on-demand environments set and various versions of libraries available for software developers to seamlessly start the development of desired applications on RISC-V based systems. Learning from ARM's Linaro project, the RISC-V Labs Initiative was started in 2022 by RISC-V International in order to help develop the RISC-V software ecosystem.

RISC-V Labs

RISC-V Labs[1] is an interest group of RISC-V International [2]. RISC-V Lab Partners provide one or more of the following [3]:

1. Continuous Integration (CI) testing of open source software projects
2. CI testing resources for use by open source communities to use on their projects
3. "Sandbox" instances of RISC-V physical and virtual hardware for open source communities and projects.

Cloud-V worked as a key lab partners member for over a year to develop and become the **first official RISC-V Lab Partner** in 2024. The presentation will show how the RISC-V labs initiative is developing and how Cloud-V offers a use case for software development using an official Service Level Agreement (SLA) with RISC-V Labs as a RISC-V Labs Partner [4]. This SLA offers RISC-V compute free of charge to open source communities using Cloud-V.

We will go through the progress we have had in the past year and try to gain feedback from the community regarding the problems they face in developing software for RISC-V.

Furthermore, it will be explained how others can join in the effort and what is expected from them to become a certified member. Lastly, we will address what is ahead in the future for RISC-V Labs such as:

upcoming & potential members:

- Oregon State University Open Source Lab
- PLCT Lab

and how we can help the RISC-V software community address their problems such as:

- Developing an open source FPGA lab.
- Standardizing and documenting a way to develop software ecosystem dashboards

Cloud-V

Cloud-V [5] is a **vendor neutral, mostly open source** (>95%, nearing 100%) **RISC-V Lab Partner platform** from 10xEngineers, that offers multiple software development services designed specifically to address development hurdles. It offers the following services:

1. An open source Continuous Integration (CI) platform
2. RISC-V Sandboxing
3. RISC-V Emulation
4. User Support for RISC-V
5. Default Software Environment Setup for RISC-V developers
6. Modeling Tools & other compute for RISC-V developers.

Cloud-V also offers on-demand environments, vendor-agnostic libraries, and seamless integration with hardware boards, eliminating the need for physical hardware access and complex setup procedures. This platform facilitates software developers' transition to RISC-V by providing sandboxed access, an emulation platform for up-to-date RISC-V System on Chips (SoCs), and community friendly CI integration for automated build triggers. Cloud-V aims to significantly reduce barriers for developers, enabling easier and more accessible software development on the RISC-V architecture.

By using Cloud-V, developers neither need to have physical access to RISC-V hardware computers nor do they have to set up an entire environment with specific versions of packages, all while having scalable compute infrastructure.

Conclusion

RISC-V Labs & Cloud-V offer an opportunity for the community to join together and offer multiple open source labs for the development of the RISC-V software ecosystem, that is vendor agnostic, accelerates the development of software and gathers the community around a one stop place to check the software progress status. We hope to spur interest and gather valuable feedback about what software developers want for the RISC-V software ecosystem.

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[1] https://riscv.org/risc-v-labs/
[2] https://riscv.org
[3] https://riscv.org/risc-v-lab-partner
[4] https://cloud-v.co/risc-v-labs-sla
[5] https://cloud-v.co