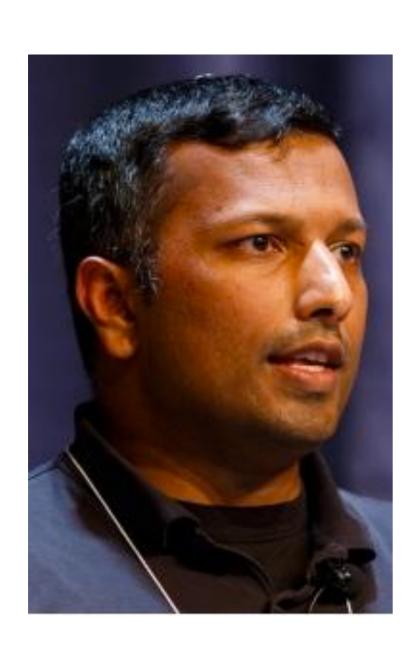# **An Update** on Building the RISC-V Software Ecosystem

Arun Thomas
BAE Systems
4th RISC-V Workshop, July 2016

Way Back in January

Let's build out the RISC-V **Software Stack** in 2016.
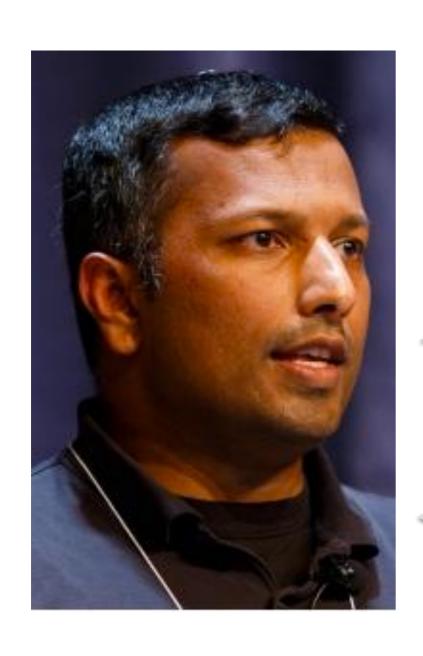
Arun's 2016 RISC-V Wishlist

- Upstream support for GNU toolchain, clang/LLVM, and QEMU

- Upstream support for Linux kernel, Yocto, Gentoo, and BSD

- Debian/RISC-V port

Making Progress

- Upstream support for GNU toolchain, clang/LLVM, and QEMU

  - Getting ready to send patches for review

  - Let's focus on upstreaming in the next 6 months

- Upstream support for Linux kernel, Yocto, Gentoo, and BSD

  - FreeBSD 11 will officially support RISC-V!

  - Let's focus on Linux kernel, Yocto, and Gentoo

- Debian/RISC-V port

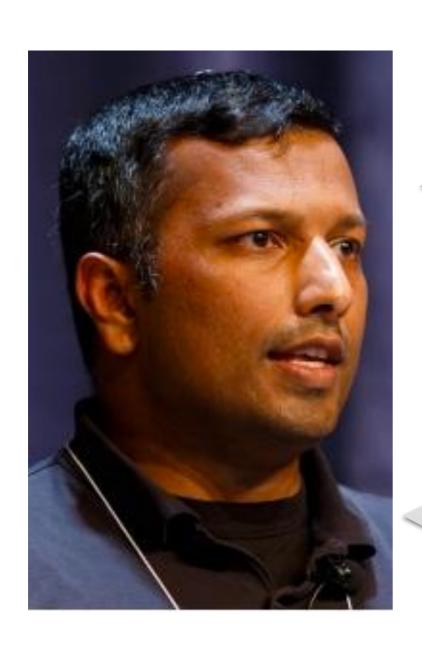 - See Manuel's talk tomorrow

Can we do better?

My Take in January

Recruit developers

Reduce startup costs

Specs. Docs

6

My Take in July

Foundation should fund developers to build core SW infrastructure

We should decide on a process for proposing ISA enhancements. Start now.

Funding Developers

What Might These Folks Do?

- Upstreaming and Maintainership

- Porting software to RISC-V

- Performance optimization/analysis

- Enhancing test suites and methodologies

- Continuous integration

- Release management

Funding Models

Proposing ISA Enhancements
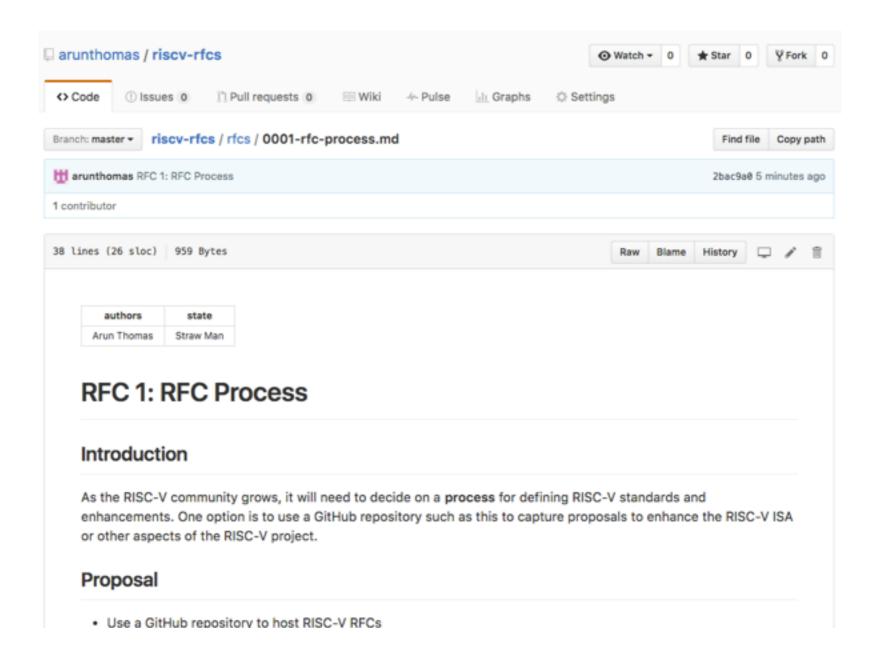
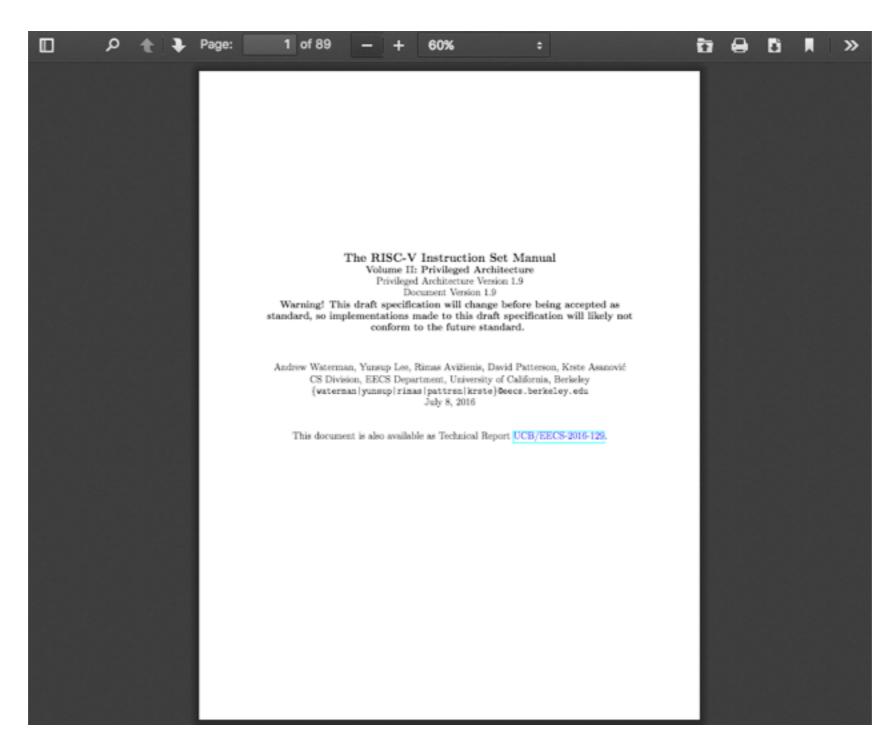# Standards, Drafts, RFCs, Proposals, …

RISC-V RFCs

- A straw man proposal to spark discussion: github.com/arunthomas/riscv-rfcs.git

- RFCs are written in Markdown text format

- Submit RFCs via GitHub pull requests

- Discussion on isa-dev and GitHub

Requesting Comments

Requesting Comments

Summary

- We are making progress on the software stack, but we could move faster

- Foundation should **fund** software developers

- Community should decide on a **process** for proposing ISA enhancements

Make ISAs great again.

Questions/Comments?

- What do **you** think we should be doing to build the RISC-V software stack?

- Let's keep this discussion going at the workshop/committee meetings and on the mailing lists.

- Contact: <u>arun.thomas@acm.org</u>, @arunthomas