3ʳᵈ Workshop Intro & Foundation Overview

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Outline

- Workshop Intro, Logistics & Agenda
- RISC-V Background
- RISC-V Foundation Overview
- Foundation Structure
  - Early group of Founding Sponsors
- Membership Agmt & By-Laws
- Summary

3rd RISC-V Workshop – Thanks Oracle!!

A big THANK YOU to the
Oracle Conference Center Team

'Networking' Workshop

- Networking focus – distribute attendee spreadsheet
  - Let Tami know by the morning break if you don't want your name to be included in the attendee spreadsheet
- Spend break / lunch / reception time with attendees you haven't met before
- Twitter @riscv
- LinkedIn Company Page
  - http://www.linkedin.com/company/risc-v-foundation

Agenda Walkthrough

4th RISC-V Workshop – Save the Date

July 12th – 13th, 2016
MIT CSAIL / Stata Center

RISC-V Foundation

RISC-V Background

- In 2010, after many years and many projects using MIPS, SPARC, and x86 as basis of research, it was time for the Computer Science team at UC Berkeley to look at what ISAs to use for their next set of projects
- Obvious choices: x86 and ARM
  - x86 impossible – too complex, IP issues
  - ARM mostly impossible – complex, IP issues
- So UC Berkeley started "3-month project" during the summer of 2010 to develop their own clean-slate ISA

RISC-V Foundation

RISC-V Background (cont'd)

- Four years later, in May of 2014, UC Berkeley released frozen base user spec
  - many tapeouts and several research publications along the way
- The name RISC-V (pronounced *risk-five*), was chosen to represent the fifth major RISC ISA design effort at UC Berkeley
  - RISC-I, RISC-II, SOAR, and SPUR were the first four with the original RISC-I publications dating back to 1981
- In August 2015, articles of incorporation were filed to create a non-profit RISC-V Foundation to govern the ISA

Foundation Mission Statement

The RISC-V Foundation is a non-profit consortium chartered to standardize, protect, and promote the free and open RISC-V instruction set architecture together with its hardware and software ecosystem for use in all computing devices.

RISC-V Foundation

Benefits from Viable Freely Open ISA

- ***Greater innovation via free-market competition*** from many core designers, closed-source and open-source
- ***Shared open core designs***, shorter time to market, lower cost from reuse, fewer errors given more eyeballs
- ***Processors becoming affordable for more devices***, which would help expand the Internet of Things (IoTs), which could cost as little as $1
- ***Software stacks survive for long time*** upgrade software on systems embedded in concrete 50 years ago
- ***Make architecture research and education more real*** with fully open hardware and software stacks

RISC-V is NOT an Open-Source Processor

- RISC-V is an ISA specification – NOT an open-source processor core

- Most of the cost of chip design is in software, so we want to make sure software can be reused across many chip designs

- The Foundation will encourage both open-source and proprietary implementations of the RISC-V ISA specification

Foundation Principles

- The RISC-V ISA and related standards shall remain open and license-free to all parties. The standard specifications shall always be publicly available as an online download
- The compatibility test suites shall always be publicly available as a source code download
- To protect the standard, only members (with commercial RISC-V products) of the Foundation in good standing can use "RISC-V" and associated trademarks, and only for devices that pass the tests in the open-source compatibility suites maintained by the Foundation

RISC-V Foundation

Foundation Function

- official source of information about RISC-V, maintains an online repository of RISC-V documents, and promotes adoption of RISC-V by organizing both online and live events
- responsible for sustaining, evolving and open-source licensing of the RISC-V instruction set architecture and surrounding hardware and software ecosystem over time in response to changes in technology and the needs and requests of the user community
- manages licensing of the RISC-V trademarks and provides a vehicle to decide whether a project or product can use the RISC-V trademark
- maintains a directory of public-domain instruction set architecture and micro-architectural techniques, culled from publications and expired patents
- produces and sells RISC-V promotional material, the proceeds from which are used to further the goals of the Foundation

Foundation Organization

- The Board of Directors consists of seven+ members, whose replacements are elected by the membership
- The Board is ultimately responsible for fulfilling the Mission Statement
- The Board can amend the By-Laws of the RISC-V foundation via a two-thirds affirmative vote
- The Board appoints chairs of ad-hoc committees to address issues concerning RISC-V, and has the final vote of approval of the recommendation of the ad-hoc committees.
- All members of committees must be members of the RISC-V Foundation
  - Committee chairs must report to the Board, and committees are subject to termination if the Board decides a committee is not making satisfactory progress
- Given the worldwide interest in RISC-V, the Board will appoint Chairs of Regional Committees to promote RISC-V development in local communities

Classes of Membership

- Platinum Sponsor dues of US$25,000 per year
  - 10 complimentary registrations for RISC-V meetings during the year of membership and the most prominent and largest display of company logos in online and print materials for RISC-V
- Platinum members are eligible for Board seat elections and to Chair Foundation Technical Committees, Marketing Committees and Sub-Committees
- Gold Sponsor dues of US$10,000 per year
  - 7 complimentary registrations for RISC-V meetings during the year of membership and prominent display of company logos in online and print materials for RISC-V
- Gold Sponsor members are eligible to Chair Foundation Technical Committees, Marketing Committees and Sub-Committees
- Silver Sponsor dues of US$5,000 per year
  - 5 complimentary registrations for RISC-V meetings and for their logos to be displayed in RISC-V online and print materials
- All Sponsor organizations have one vote per open position in Board elections.
- Auditor dues of US$2,500 per year (non-voting)
  - 2 complimentary registrations for RISC-V meetings during the year of membership and for their names to be listed in online and print materials for RISC-V
- Individual Member dues of US$99 per year (non-voting)

"Founding" Member Status

- Members who join and fund during the Foundation's inaugural launch year, will forever after be denoted as *Founding Members* on the RISC-V website and all promotional materials, provided they remain members in good standing
- Foundation inaugural launch year runs through our first year of operation and ends at the start of the 4th RISC-V Workshop in July 2016

Strong Founding Sponsor Group

Platinum Founding Sponsors

bluespec

DRAPER

Google

Hewlett Packard **Labs**

Microsemi

ORACLE

siFive

Gold & Silver Founding Sponsors

antmicro EMBEDDED SYSTEMS

codasip

GRAY RESEARCH

LATTICE SEMICONDUCTOR

lowRISC

ROA LOGIC

Rumble Development

Syntacore Custom cores and tools

Technolution

Foundation Status

- Articles of Incorporation filed August 2015
  - RISC-V Foundation Corporation is a legal, non-profit operating entity
- Signed on 16 "Launch Fund Contributors" to date
  - shape the initial by-laws and membership agreements
  - promote the Foundation
  - recruit other members
- Form Board of Directors in Q1 of 2016
  - Ratify membership agreement
  - Ratify set of bylaws

Membership Agmt Key Terms

- Free and open license – Foundation grants to the Member a non-exclusive, zero royalty right and license …to use, make, have made, offer for sale, sell, export, import, practice, copy, …the RISC-ISA as then constituted (the "Member License")
- Member Contributions & Improvements – Member grants to the Foundation a non-exclusive, zero royalty right and license …to use, make, have made, offer for sale, sell, export, import, practice, copy, …for each and all of the Improvements and each and all Intellectual Property Rights in and to such Improvements (the "Core License")
- Some discussion around separating IPR and Copyright licensing language to facilitate individual treatment and updates

Bylaws Key Terms

- Defines the role of the Foundation
- Defines Membership Levels and Rights
  - One vote per company
- Defines the role of the Board of Directors
  - Ratify all all Committee recommendations (Technical, Marketing, etc)
- Defines Committee Responsibilities
  - All specification development to be done by Membership Committees
  - All specification development must include at least one round of public consultation (outside the membership)

RISC-V Foundation Summary

- **Strong Industry Support**
  - 16 Founding Sponsors to date
  - Broad academic interest
- **Membership & Bylaw documents in review**
- **Board of Directors to be formed in Q1 2016**
- **4th RISC-V Workshop save the date:**

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