Introduction to RISC-V

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February, 2016

RISC-V *in simula*

Pretty straightforward to put your own instance together…

Software Tools

RISC-V Tools
    GCC
    GDB
    LLVM
    Clang
    Verification Suite
Linux   Yocto

Software Implementations

Spike (ISA Simulator)   QEMU
ANGEL (JavaScript ISA Simulator)

Specifications

User-Level ISA Spec v2.0   Draft Compressed ISA Spec v1.9
Draft Privileged ISA Spec v1.7

Founding Membership Levels

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, Marketing & Sub-Committees

Silver Sponsor dues of US$5,000 per year - 5 registrations for RISC-V meetings and for 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)

Membership Level: Platinum & Gold

Bluespec , Inc. provides tools and IP for ASIC and FPGA system design and verification with a focus on the RISC-V ecosystem. Our RISC-V Factory provides a complete verification and debug environment for design teams developing their own RISC-V processors. Future products include RISC-V synthesizable cores enhanced by general purpose hardware acceleration. **Draper**, a not-for-profit research and development company, focuses on the design, development and deployment of advanced technological solutions for the world's most challenging and important problems. We provide engineering services directly to government, industry, and academia; work on teams as prime contractor or subcontractor; and participate as a collaborator in consortia. We provide unbiased assessments of technology or systems designed or recommended by other organizations — custom designed, as well as commercial-off-the-shelf. **Google** Inc. is an American multinational technology company specializing in Internet-related services and products. These include online advertising technologies, search, cloud computing, and software. **Hewlett Packard Labs** delivers breakthrough technologies and pioneering research; addressing the most complex challenges and opportunities on the horizon for our customers and society. **Microsemi** Corporation offers a comprehensive portfolio of semiconductor and system solutions for communications, defense & security, aerospace and industrial markets. Products include high-performance and radiation-hardened analog mixed-signal integrated circuits, FPGAs, SoCs and ASICs; power management products; timing and synchronization devices and precise time solutions, setting the world's standard for time; voice processing devices; RF solutions; discrete components; enterprise storage and communication solutions, security technologies and scalable anti-tamper products; Ethernet solutions; Power-over-Ethernet ICs and midspans; as well as custom design capabilities and services. Microsemi is headquartered in Aliso Viejo, Calif., and has approximately 4,800 employees globally. **Oracle** offers a comprehensive and fully integrated stack of cloud applications, platform services, and engineered systems. With more than 420,000 customers—including 100 of the Fortune 100—in more than 145 countries, Oracle provides a complete technology stack both in the cloud and in the data center. Oracle's industry-leading cloud-based and on-premises solutions give customers complete deployment flexibility and unmatched benefits including application integration, advanced security, high availability, scalability, energy efficiency, powerful performance, and low total cost of ownership. **SiFive** was founded by the creators of the free and open RISC-V architecture as a reaction to the end of conventional transistor scaling and escalating chip design costs. By leveraging the power of open-source and agile hardware design, SiFive reduces the cost and time to harness the performance and energy-efficiency of customized silicon, enabling a wide range of applications from IoT to hyper-scale computing – all unified by the common RISC-V platform. **Western Digital** Corporation is an industry-leading developer and manufacturer of storage solutionsthat enable people to create, leverage, experience and preserve data. The company addresses ever-changing marketneeds by providing a full portfolio of compelling, high-quality storage solutions with effective technology deployment, high efficiency, flexibility and speed. Our products are marketed under the HGST and WD brands (You can add G-Technology if you'd like) to OEMs, distributors, resellers, cloud infrastructure providers and consumers. **Espressif** is dedicated to the research, design, and distribution of IoT solutions. We continually strive to transform the communication industry through ever improving IoT solutions via energy, performance, and functionality optimization, improving the lives of consumers and enterprises in countless ways in the years to come.

Membership Level: Silver

Adapteva, Inc. is a privately held semiconductor company founded in 2008 and based in Lexington, Massachusetts. The company designs and builds massively parallel microprocessors and compute modules for electronics systems with extreme energy efficiency requirements. **Antmicro** Ltd is an innovation company that develops and integrates embedded software and technologies for various branches of industry and the emerging ecosystem of the Internet of Things (IoT). The company provides R&D services for customers worldwide, offering assistance in prototyping, new products development and adoption of modern embedded technologies, both in the hardware and software area. The majority of projects Antmicro participates in include various open source and open hardware technologies such as RISC-V, OpenRISC, LEON, Linux, Android, FreeBSD, ConTiki, RIOT, eCos, FreeRTOS, RTEMS, gstreamer, OpenCV, etc. **Codasip** delivers leading-edge tools and IP, including RISC-V, to enable adoption of Application Specific Instruction-set Processors (ASIPs). ASIP's utilize dedicated instructions/architecture to create the optimal processor for a specific application or class of applications, and are at the heart of devices that require very high performance with low power. Codasip's unique technology makes ASIP adoption as simple and easy as standard embedded processor cores. Formed in 2006 and headquartered in Brno, Czech Republic, Codasip currently has offices in the US and Europe. **Gray Research** LLC is a hardware and software development consulting firm located in Bellevue, WA, USA that specializes in design and implementation of solutions and IP for energy efficient, FPGA-optimized parallel compute accelerators, extreme bandwidth Hoplite NOC routers, soft processor cores, and related tools. We are pleased to support the RISC-V Foundation as a means to boost collaboration and innovation in computer architecture research and practice. **Lattice Semiconductor** is the global leader in smart connectivity solutions, providing market leading FPGAs, standards based ASSPs, and mmWave devices that enable more than 8,000 global customers to quickly deliver innovative and differentiated cost and power efficient products. The Company's broad end-market exposure extends from consumer electronics to industrial equipment, communications infrastructure and licensing. Lattice was founded in 1983 and is headquartered in Portland, Oregon. **lowRISC** is a not-for-profit project producing fully open hardware systems. From the processor core to the development board, our goal is to create a completely open computing ecosystem. **Roa Logic** is a privately owned and funded design services company. We specialise in custom IP development and FPGA cost reductions. Since 2003, **Rumble Development** has provided custom logic solutions to OEMs worldwide. Focussed primarily on imaging, Rumble has created special purpose cameras ranging from ultra-low power time-lapse to high-resolution multi-sensor designs. Rumble was the first company to launch a commercial RISC-V design, and will use RISC-V in the majority of its upcoming products. **Syntacore** develops and licenses synthesizable programmable cores, specialized for the customer's workload. Company also provides the following services: **Technolution** develops electronics, programmable logic and software solutions for technical information systems and embedded systems. The company operates for over 25 years in the traffic and transport, high-tech industry and energy sectors. Clients are manifold and include governments, OEMs and ODMs. Technolution is an employee owned SME of approximately 180FTE based in Gouda, The Netherlands. Technolution designs, develops and delivers innovative solutions and products in close cooperation with its clients. From concept to implementation, we provide advice, specification, design, realization, system integration, management, and maintenance. Technolution supplies reliable and working solutions for company critical situations where a reliable solution with high availability is required.