RISC-V is inevitable

Calista Redmond
CEO RISC-V International

@Calista_Redmond
@risc_v

March 2024
Global standards are catalyst to accelerate technical innovation

Standards have been critical to technology innovation, adoption, and growth for decades.

Standards create access to opportunities and spur growth for a wide range of stakeholders.

RISC-V is a standards-defined Instruction Set Architecture developed by a global community.
The definition of open computing is **RISC-V**

RISC-V is the most prolific and open Instruction Set Architecture in history

### RISC-V is inevitable

**Mission:** RISC-V is the industry standard ISA across computing

- >10 Billion RISC-V cores already shipped
- Adoption moving rapidly across all domains
- Demand at every performance level (low to ludicrous)
- Shared investment driving ecosystem

### RISC-V enables the best processors

RISC-V enables profound innovation from low end to high end applications

- Inherent and sustainable performance and efficiency advantage
- Design flexibility and freedom
- Supported by massive community enabling the most efficient designs for full spectrum of applications
- Modern design for fewer instructions

### RISC-V is rapidly building the strongest ecosystem

RISC-V instrumented with software top of mind

- Open standards enable software choice Applications keen to run on RISC-V.
- Toolchain and OS support required for Extension ratification
- Single hypervisor standard to simplify and unify application support
- Thousands of software developers
- Strategic investment by industry and geographies
RISC-V will be in more than 16 billion SoCs by 2030.

RISC-V expected to be included in billions of SoCs, enabling one or more of these functions:

- Deeply Embedded (e.g. Finite State Machine)
- Microcontroller
- Co-Processor
- Application Processor (e.g. host CPU)

CAGR >40%

Source: The SHD Group, November, 2023

*forecast
Selected Market Share Projections for RISC-V in 2030

**Wearables/MCU**
- RISC-V: 29%
- TAM: 2.6B units

**Computing Notebooks**
- RISC-V: 22%
- TAM: 2.7B units

**Communications 5G Infrastructure**
- RISC-V: 20%
- TAM: 1.8B units

**Consumer AI Acceleration**
- RISC-V: 36%
- TAM: 6.4B units

**Industrial Smart Grid**
- RISC-V: 22%
- TAM: 670M units

**Automotive AI Acceleration**
- RISC-V: 27%
- TAM: 260M units

*Source: The SHD Group, November, 2023*

Based on projected SoC volumes
New RISC-V processors

- Codasip first commercial CHERI security implementation
- RISC-V Tensor Unit for ultra-fast AI solutions
- Performance P870 and Intelligence X390 for generative AI and ML
- Data center CPU chiplet solution with I/O hub, DDR memory, PCIe, up to 192 cores
- NA900 certified compliant ASIL D of ISO 26262 standard
- TESIC RISC-V IP passes SERMA CC EAL5+ security tests
- BA5x™ RISC-V processors for low power and EMSA5-FS for functional safety
- Use of AI to design RISC-V CPU in under 5 hours
Applications

- **Qualcomm RISC-V wearable platform with Google Wear OS**
- **First generative AI RISC-V appliance**
- **RISC-V tablet, portable Linux console, and cluster**
- **Vega, the first RISC-V 10 gigabit Ethernet switch**

- **First RISC-V IoT security Towngas Chip has sold over 1,000,000 units**
- **Two self-developed RISC-V communications chips**
- **Andes N25F for performance and low power in enterprise SSD controller, AndesCore™ RISC-V multicore vector processor**
- **MTIA v1: Meta’s first generation AI inference accelerator**
Developers

- Android added RISC-V to list of supported CPU architectures
- ASUS IoT Tinker V board based on AndesCore AX45MP
- Industrial edge solutions including High Level Synthesis for C/C++, vector SDKs for AI/ML inferencing
- Debian GNU/Linux officially Supported on RISC-V architecture
- BeagleV Ahead single board computer released
- Terapines ZCC toolchain supports Andes RISC-V processors
- Imperas to Provide Simulation Model of Tenstorrent Ascalon RISC-V Core
- nanoCH32V003 is a 32-bit RISC-V core for $1.50
Industry outlook: Automotive

RISC-V scales across every compute application in the vehicle.

RISC-V enables the supply chain to work together while enabling innovation and differentiation.

Ecosystem offers wide breadth of choice, as well as support and expertise required for auto.

RISC-V will capture 27% of automotive AI acceleration by 2030.

The SHD Group, November 2023
Industry outlook: Datacenter & Cloud

- RISC-V offers unique opportunity for accelerators
- Custom computing for AI and other emerging workloads
- Achieve your performance and power targets

RISC-V CPU core market will grow 115% CAGR, capturing >14% of all CPU cores by 2025

Semico Research, December 2021
Industry outlook: Telecom & Consumer Devices

- Innovation across the industry, from handsets to infrastructure
- Android support
- Diverse smartphone workloads, from central processing to connectivity to sensors

RISC-V will capture 20% of Communications 5G infrastructure by 2030

The SHD Group, November 2023
Industry outlook: Internet of Things

Streamlined instruction set enables efficient and compact code for improved performance and energy efficiency.

Strong fit for localized workloads such as machine learning, sensors, and security.

Advanced custom processing for workloads like AI to run at the edge.

RISC-V will command 28% of the IoT market by 2025
Counterpoint Technology Market Research, September 2021

By 2028, the number of RISC-V processors shipping into IoT will approach 20 billion
Omdia Research, May 2023
More than 4,100 RISC-V Members across 70 Countries

RISC-V membership up 28% in 2023
Building the strongest ecosystem

Total market cap of $5.5T
Funding of $8.5B

landscape.riscv.org
Engage with RISC-V

Elevate Industry Leadership

- Deepen expertise in Special Interest Groups
- Show technical and industry leadership
- Leverage Industry Market development
- Engage global reach of RISC-V marketing, media, and social channels

Achieve Business ROI

- Reduce technical overhead and accelerate roadmap with global open standard
- Reduced strategic risk implicit in collective investment of global stakeholders
- Accelerate sales pipeline with RISC-V support across channels
- Showcase solutions on RISC-V Exchange and Ecosystem Landscape
- Qualify products as RISC-V Compatible™

Gain Technical Advantage

- Gain insight and access to technical deliverables in motion
- Infuse your technical directions in specifications
- Accelerate technical knowledge working with domain experts, cultivate and retain talent
- Be part of local developer groups and industry developer networks

Build Strategic Network

- Cultivate partner, supply chain and customer strategic relationships
- Align and leverage global, local and industry networks, alliances, and events
- Amplify visibility online, and at events

Join RISC-V as a member
www.riscv.org
RISC-V is Inevitable
This is the open era of computing.