Emulators and Simulators

This page gives an overview of upstream projects. If you miss information or find mistakes, please edit.

- **QEMU**
  - RISC-V maintainers
  - Releases
  - RISC-V status
- **Spike / riscv-isa-sim**
  - RISC-V status

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**QEMU**

QEMU is a generic and open source machine emulator and virtualizer.

- QEMU Homepage
- Source Release Page

**RISC-V maintainers**

- Alistair Francis (WDC)
- Palmer Dabbelt (Google)

**Releases**

- QEMU 6.0.0 (2021-04-29)
- QEMU 5.2.0 (2020-12-08)
- QEMU 5.1.1 (2020-08-11)
- QEMU 5.0.0 (2020-04-28)

**RISC-V status**

- RV32GC = RV32IMAFDC is implemented
- RV64GC = RV64IMAFDC is implemented
- Privileged and unprivileged instruction specifications are supported
- RV32E is supported
- RISC-V specific wiki page: https://wiki.qemu.org/Documentation/Platforms/RISCV
- Unrated extension support is kept mainline
  - Vector extension v0.7.1

**Spike / riscv-isa-sim**

Spike, the RISC-V ISA Simulator, implements a functional model of one or more RISC-V harts.

- Spike github repository

**RISC-V status**

- Spike has historically been the proof-of-concept target for all RISC-V extensions (it has recently been superseeded by a SAIL generated simulation)
- RV32GC = RV32IMAFDC is implemented
- RV64GC = RV64IMAFDC is implemented
- Additionally: Zifencei, Zicsr
- Q v2.2
- Support for LE and BE
- Spike is sequentially consistent
- Machine, Supervisor, and User modes, v1.11
- Unrated extensions:
  - B (bimanip) v0.92
  - K (scalar crypto) v0.8.1
  - V (vector) v0.10 with Zvlseg/Zvamo
  - P (simd) v0.9.2
  - H (hypervisor) v0.6.1
  - Svnapot extension v0.1
  - Debug v0.14