Linux Plumbers Conference 2021
The RISC-V Platform Specification
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Kumar Sankaran, Atish Patra, Mayuresh Chitale
Agenda

- Platform Policy
- Platform Specification
- Open Discussions
Platform Policy

• Document governing the policies and procedures used for RISC-V platforms
  - [https://docs.google.com/document/d/1U5qLoztZpCRSnw2s8tx4rB0SFPMQ27Svrr9jWRsOziY/edit](https://docs.google.com/document/d/1U5qLoztZpCRSnw2s8tx4rB0SFPMQ27Svrr9jWRsOziY/edit)

• Scope and Goals
  - Platform specifies a common, reusable hardware and software environment for portability
    - same software will run on all compatible hardware platforms without any modifications
  - Defines the structure, definitions, life cycle, naming conventions and branding for the various platforms within the platform specification
  - Developed and released by the RISC-V Platforms Horizontal Subcommittee
    - RISC-V Platforms HSC [https://lists.riscv.org/g/tech-unixplatformspec](https://lists.riscv.org/g/tech-unixplatformspec)
  - Operating under the auspices of the RISC-V Software Horizontal Committee
  - Ensure software and hardware interoperability via a platform spec
  - Promote independent development of hardware and software
Platform Policy

- **Structure**
  - Platforms will have a mandatory base feature set
  - Optional extensions covering the requirements of entire market segments or industries (e.g., “mobile,” “automotive,” “server”)

- **Release Cycle and Versioning**
  - Major releases every 2-years (2022, 2024…)
  - Amendments/extensions can be released in the odd years

- **Naming and Versioning Representations**
  - Platform name is prefixed by "RISC-V” and postfixed by its year and a dot-separated revision number
    - E.g. “RISC-V OS-A Platform 2022”
  - For machine-identifiable purposes, we use a URI-encoded name
    - riscv-platform://riscv.org/platform/OS-A/2022.3

- **Life Cycle**: Covered in the policy document
- **Platform Compatibility Test (PCT)**: Test document for self compatibility; being developed
Platform Policy

• Conventions
  - Features may contain the following structural elements
    - Requirements
      - MANDATORY - Must be implemented
      - DEPRECATED - Must be implemented in the current version, expected to be removed in the next future version
    - Application Notes, Recommendations

• Claiming Compatibility
  - A Platform product compatibility claim can only be made if a product satisfies the following:
    - all requirements of the respective base Platform; and
    - all requirements of each extension the product claims compatibility with
  - No Platform shall claim compatibility with an extension if it is not compatible with the respective base specification
  - A Software product claiming compatibility with a Platform (and extensions) must satisfy:
    - all requirements of the Platform and of all Extensions that it claims compatibility with
  - Any software that works on the base-platform, will also work in the presence of extensions
  - Any software that requires an extension, may not be compatible in the absence of the extension
Platform Specification

Software that runs on a platform compatible with the base specification will run on a platform that is compatible with extensions.

Software that runs on a platform compatible with extensions may not run on a platform compatible only with the base specification.

A hardware platform that is compatible with an extension is compatible with the corresponding base specification.
Platform Specification


- **2022 Platforms**
  - OS-A Platform: This specifies a rich-OS platform for Linux/FreeBSD/Windows - flavors that run on enterprise and embedded class application processors
    - Base
    - Server Extension
  - M Platform: This specifies an RTOS platform for bare-metal applications and small operating systems running on a microcontroller
    - Base
    - Physical Memory Protection (PMP) Extension

- **Schedule**
  - Frozen version 1.0 targeted by RISC-V Summit - Dec 2021