

## Jun 6, 2024 | 📅 Performance Sampling TG

Attendees: Beeman Strong   Snehasish Kumar   tech.meetings@riscv.org

### Notes

- **Slides/video** [here](#)
- Intros:
  - Beeman - Rivos, chair of perf analysis SIG, work on PMU, debug, trace HW
  - Bruce - SiFive, work on PMU, debug, trace HW and tools
  - Dmitriy - Syntacore, perf tools, former Intel/Vtune
  - Hengbo - ISCAS, perf on RISC-V, following progress
  - Atish - Rivos, Linux kernel & qemu, work on perf to enable perf analysis ISA extensions
  - Shashank - Condor, lead arch perf group, microarchitect
  - Snehasish - Google, profile-guided opts and analysis in datacenter
  - Ved - Rivos, here to participate
- Review [proposed charter](#)
  - Should the TG name be performance sampling?
    - Don't really sample on "performance"
    - Maybe performance event sampling, since that's what you sample?
    - But not always collecting events, sometimes metrics like IPC
      - This group focuses more on the method than what is collected
    - Could be perf data sampling
    - Group prefers Performance Events Sampling TG
  - Should the charter include the purpose of all of this?
    - Mentions closing the gap of lack of attribution
    - SIG looks at bigger picture, this TG just deals with defining the ISA
  - Should we remove Spike as a POC option?
    - Spike has been enabled for perf analysis extensions, but not used for POCs
    - But Qemu isn't cycle-accurate, doesn't generate many events. Is it really sufficient?
      - As long as there is one event we can use (insts retired?) it's okay for a POC
    - Maybe better to say we'll demonstrate the usability of the ISA for kernel and tools, with virtualization and security. Not end-to-end solution.
      - Can't do any useful profiling on an emulator
      - Just demonstrating HW/SW ifc
    - Add that ISA extensions will be compatible with H, and support security objectives
  - What about precise attribution for speculative events? Probably don't want to limit ourselves to non-speculative events.

- Agreed, implementations can decide which events will support precise attribution, to be indicated in JSON file
  - But for collecting state, how to associate state with non-spec events?
    - State will be associated with the instruction
- For instr sampling, some implementations may not select at dispatch. Could do it at fetch? Or even retire?
  - The ISA shouldn't dictate implementation, though could have a non-normative note about implementation
  - Remove "selected at dispatch"
- SiFive has a sampling spec, PIPES (per-inst perf event sampling), planning to donate it in a week or so
  - Will host a presentation, next few weeks
- Next steps
  - Approve charter, elect permanent chairs, ratification plan review, iterate on ISA

Action items

