Jun 2, 2022 | 📅 RISC-V Perf Analysis SIG Meeting

Attendees: Beeman Strong   LIU Zhiwei   tech.meetings@riscv.org

Agenda
- Gap analysis continued (60 min)

Notes
- **Attendees**: Beeman, Zhiwei, Bruce, John Simpson, Atish, Aaron, Philipp, Anup, Furquan, Jeff S, Sergey
- **Slides and video available [here](#)**
- John joined from SiFive, background in processors (25 years in design)
- Branch history
    - Commonly used to improve instruction profiles, important gap
    - Philipp: agree that this is a gap, should talk to unpriv group for guidance on how to fill. Lies outside of SW HW.
    - Beeman: suspect this will be controlled by priv SW, so probably want Priv IC
- CPU Events
    - Consider discovery mechanism for standard events?
    - Bruce: what about events in OpenSBI?
        - Beeman: those perf standard events would be a good starting point, but this is about HW indication of which events are supported
- Analysis Methods
    - Other arch's have HW support for methods like TMA, cycle accounting, and CPI stacks
    - Philipp: SPE non-interrupt driven, since interrupt was always too imprecise. Also latency impact was unpredictable.
        - Beeman: included here because seems like it could be used for high-level bottleneck identification, but no documentation of that. Probably just too new.
    - Philipp: CPI = cycles per instruction, trying to track latency per instruction stream, find instructions that take longer and why
- SW events
    - Philipp: ProbeNop was used in the past to create very fast user-level events, used with probing and probe points. Insert ProbeNops in place of Nops. Useful when tracing an interface, e.g., dtrace.
- System software
    - Atish working on KVM enabling for RISC-V PMU
- Linux/perf
    - Philipp: will see if someone can work on perf user interface
    - Bruce: SiFive has made perf changes to support filtered modes
        - Atish: is this just support for HiFive unmatched events?
        - Bruce: no, :u for user mode

- ■ Atish: let's sync up offline. See requests for json event file support (for event names on raw events), and standard event enumeration/filtering.
  - ○ Atish: Unique ID patch was for SiFive but trying to generalize
- ● Tools
  - ○ Philipp: SyntaCore has interest in something Vtune-like for RV, get weekly requests about this
    - ■ Gprof and gprof-ng doesn't have a RV backend, has good overlap with Vtune [missed something here]
    - ■ Want to get one tool fully ported more than many tool partially ported
  - ○ Will Intel port Vtune?
    - ■ Intel will ramp team up this year and get to work next year, so won't be quick to get their help in filling gaps

Action items
- ☑ ~~Beeman Strong - send tools/libraries gaps to the mailing list, to prep for next time~~
- ☐ Philipp Tomsich - look for owner for perf RISC-V user interface