

Mar 30, 2023 | 📅 RISC-V Control Transfer Records TG Meeting

Attendees: tech.meetings@riscv.org Beeman Strong Bruce Ableidinger

Notes

- **Attendees:** Beeman, Bruce, JohnS, Snehasish
- **Slides/video** [here](#)
- Reviewed S-mode registers discussed last time, and addition of M-mode access
 - Typo: mctrcontrol upper bits go down to 8 not 7
- Reviewed delegation of CTR to S-mode
 - sctrcontrol reg accesses subset of mctrcontrol, when SEN=1
 - Agreed that SEN bit, which delegates CTR to S-mode, should be required for implementations that support both CTR and S-mode
 - Avoids need for SBI extension
- Reviewed delegation of CTR from S-mode to VS-mode
 - New vsctrcontrol reg accessible via sctrcontrol when V=1, if VSEN=1
 - Moves some priv mode inhibit bits around, since VM will (e.g.) set S=1 when it really wants VS=1
 - Agreed that VSEN bit should be required for implementations that support both CTR and H extension
- Discussed how priv mode filtering applies to transfers that transition modes
 - Basing filters on origin or dest mode will mean recording traps or trap returns in a U-mode-only config
 - Basing filters on more privileged mode avoids traps, captures only transfers within enabled mode(s)
 - Bruce: having the option to include traps to an inhibited mode seems important
 - Snehasish: agree. Have tried instrumented trace, which is stitched together with PT or LBR trace (processed offline). LBR/PT includes kernel. So not entirely analogous.
 - Could zero PCs from an inhibited mode
 - Would mean PC 0 is “special”, implies this record is a priv mode transition (if no transfer type included in ctrdata)
 - For U-mode-only trace, could use dest-mode option and just require inhibiting trap returns if don't want to see traps. But doesn't work for VM use.
 - Need to come up with a way to do this
 - Discusses whether records for both trap and trap return are desired, but agreed that just one is better.
 - Latency should have only cycles in enabled mode, so traps don't create appearance of a really slow basic block. Will discuss more when we cover LATENCY field.
- Out of time, will close on the above and start on standardized optional features next time

Action items

