May 23, 2024 | 📅 RISC-V Performance Events TG

Attendees: Beeman Strong   Dmitriy Ryabtsev   tech.meetings@riscv.org

Notes
- **Attendees**: Dmitriy, Beeman, MattT, BruceA, RobertC, Atish, GregF
- **Slides/video** here
- Looking at cache/TLB events PR here
- STORE.MERGE - could mean write-combine, or could mean WB/UC store hits existing WCB. Do we need 2 events here? Can't remember how the WB case works.
- L1D.PF.ISSUED will show up as L2.PF.ACCESS/HIT/MISS
- Do we need FILLS? Prefetches can be dropped
- A nice but complicated event: indication that prefetch was used/unused. PF.UNUSED?
  - Costly, requires a bit per cacheline to track use. Keep this optional.
- Should add L1I.PF.* events
- Should we count cache flush instructions, at which level they evict? Probably don't need now.
- L2.STORE.HIT.RFO: RFO = Read For Ownership. Just gets ownership of the line to L1 (which may have it in S-state), doesn't need to transfer state.
- OTHER_CORE_HITM - useful for detecting sharing (false and true). But complicated, have to send indication of remote HITM to the requester
  - HITM = snoop that hits line in modified state
  - Easier would be to count these at the cache that had the line in M, but is that useful?
  - In sharing cases, both users should see remote HITMs, so maybe it's okay if locally we count the HITMs from the other core(s)?
  - May be worth defining 2 events, one for local counting and one for version that sends the data source info. If implementing other data source events then sending HITM indication shouldn't cost much more.
  - **AI**: Beeman to check with some experts on this local counting idea
- MISS_CYCLES - intended to count latency between TLB miss and delivery of the translation
  - What if 2 walkers? Double-count those cycles?
  - Probably best to just count cycles when any walk outstanding
  - How to use this? App dev would probably just use TLB miss events. If misses are taking longer than expected, this event would be high, but app dev can't do anything about that. Maybe more interesting to kernel dev?
- Name/desc should make clear whether counting events, cycles, etc. Probably can by default assume events, and add indication (e.g., _CYCLES) if something else.
- **Out of time**

Action items
- ☐ Beeman Strong - May 23, 2024 - check on idea to count remote HITMs locally

☐ Beeman Strong - Apr 25, 2024 - check on how perf uses ScaleUnit