Date: 2021/11/21

Task Group: Fast Interrupts

Chair: Dan Smathers

Co-Chair: Kevin Chen

Number of Attendees: 7

Current issues on github: https://github.com/riscv/riscv-fast-interrupt/issues

Previous meeting minutes: https://github.com/riscv/riscv-fast-interrupt/tree/master/minutes

Fast Interrupt DoD (Definition of Done) Status:
https://wiki.riscv.org/display/TECH/Fast+Interrupts+TG

Next meeting agenda (12/21/21) (note 12/7/21 is cancelled due to summit).

#97 – proposed reformat of xcause CSRs (bigger discussion).

More open issue discussion? Discuss if pulls resolve discussed issues.

Meeting minutes

#81 – programming clic in s and u modes – discussions in hypervisor group about a more general pattern of delegating configurable features. - can #81 be closed due to #96, #80 issues? closed.

#92 – hypervisor compatibility – Is there a use-case for clic with hypervisor? Some options:

1) a minimal CLIC extension that adds HS mode as another privilege layer in the stack, so the hypervisor could optionally receive interrupts and optionally enable/hide interrupts from lower privilege modes. This would allow the 2-stage translation and other features of the hypervisor to be used in a CLIC-based system, but would not support sending interrupts directly to descheduled guest OS contexts (have to route via hypervisor interrupt).

2) support multiple descheduled CLIC contexts to which interrupts could be sent directly while they were sleeping, which would be a much bigger project.

3) add an extension to AIA (instead of working on CLIC) to somehow reduce interrupt latency using the standard hypervisor stack.

Github updates since last minutes:

Closed #81

Specification updates since last minutes:

Open issue status:

Issues that can be closed?

Need spec updates:

#45 – all priv modes in clic or all in clint. Need spec update that only m-mode can select. Pull #173 tries to close.

#49 – reopened: prev spec had single control for multiple harts but current spec implies control per hart and implications.

#75 – move hw vectoring to separate section in spec - waiting until other spec updated before making this large text change.

#96 – proposed reformat of cliccfg. bit spec change, small hw change.

#107 – heritage of features. keep researching and adding references to bibliography.

#109 – add arch string for CLIC – need appropriate named and versioned sub-extensions of clic. Smclic? smclicx if we break into pieces.

#158 – change CLICCTRLBITS to CLICMLPBITS.

#160 - can rewrite to allow for but not assume n-extension is available.

#180 – look for references to processor in spec and change to hart

Need more discussion:

#97 – proposed reformat of xcause CSRs (bigger discussion).

#102 - preemptible interrupt handler code (for section 7.2)

#29/#155 – clarify inttrig details. Entire meeting discussed CLIC trigger details with Tim from debug group. CLIC, trigger module, and hart need to be tightly integrated since these features need to be in the core to get sync behavior. discussion on where the details are written down. E.g. CLIC spec describes set of interrupts selected for interface to debug, debug specifies what happens on that event (enter debug mode, start trace, stop trace). For now, keeping abstract action in CLIC, debug takes concrete action. try do discuss more over email reflector.

#171 – CLICCFGLBITS parameter - related to #80, #158.

Issues related to work in other TGs:

#91 – DTS entry – have linux group review DTS example.

Issues waiting on ratification (encoding/opcode consistency review needed)

#88 – CSR address mapping

Issues punted for rev1, keep open for future enhancements:

#82 – xcause register behavior with some modes in clic and some in clint.

#92 – hypervisor compatibility – goal is not to virtualize CLIC but to allow virtualization of device interrupts. proof of concept is harder. put non-normative text as a possibility. it should work as this way but not-ratifying it with it.

#99 – horizontal interrupt window

#100 – reserve immediate bits

#101 - xnxti to trigger on equal level

#106 – allow level change

#108 – pushint/popint?