TRCCNTCTLR<n>, Counter Control Register <n>, n = 0 - 3

The TRCCNTCTLR<n> characteristics are:

Purpose

Controls the operation of Counter <n>.

Configuration

External register TRCCNTCTLR<n> bits [31:0] are architecturally mapped to AArch64 System register [TRCCNTCTLR<n>[31:0]](#).

This register is present only when FEAT_ETE is implemented, FEAT_TRC_EXT is implemented and UInt(TRCIDR5.NUMCNTR) > n. Otherwise, direct accesses to TRCCNTCTLR<n> are res0.

Attributes

TRCCNTCTLR<n> is a 32-bit register.

Field descriptions

31 30 29 28 27 26 25 24 23 22 21 20 19 18	17	16	15	14 13	12 11 10 9 8	7
RES0	CNTCHAIN	RLDSELF	RLDEVENT_TYPE	RES0	RLDEVENT_SEL	CNTEVENT_T

Bits [31:18]

Reserved, res0.

CNTCHAIN, bit [17]

For TRCCNTCTLR3 and TRCCNTCTLR1, this field controls whether the Counter decrements when a reload event occurs for Counter <n-1>.

CNTCHAIN	Meaning
0b0	The Counter does not decrement when a reload event for Counter <n-1> occurs.

0b1	Counter \<n> decrements when a reload event for Counter \<n-1> occurs. This concatenates Counter \<n> and Counter \<n-1>, to provide a larger count value.

CNTCHAIN is not implemented for TRCCNTCTLR0 and TRCCNTCTLR2.

The reset behavior of this field is:

- On a Trace unit reset, this field resets to an architecturally unknown value.

RLDSELF, bit [16]

Controls whether a reload event occurs for the Counter, when the Counter reaches zero.

RLDSELF	Meaning
0b0	Normal mode. The Counter is in Normal mode.
0b1	Self-reload mode. The Counter is in Self-reload mode.

The reset behavior of this field is:

- On a Trace unit reset, this field resets to an architecturally unknown value.

RLDEVENT_TYPE, bit [15]

Chooses the type of Resource Selector.

Selects an event, that when it occurs causes a reload event for Counter \<n>.

RLDEVENT_TYPE	Meaning
0b0	A single Resource Selector. TRCCNTCTLR\<n>.RLDEVENT.SEL[4:0] selects the single Resource Selector, from 0-31, used to activate the resource event.

0b1	A Boolean-combined pair of Resource Selectors. TRCCNTCTLR<n>.RLDEVENT.SEL[3:0] selects the Resource Selector pair, from 0-15, that has a Boolean function that is applied to it whose output is used to activate the resource event. TRCCNTCTLR<n>.RLDEVENT.SEL[4] is res0.

The reset behavior of this field is:

- On a Trace unit reset, this field resets to an architecturally unknown value.

Bits [14:13]

Reserved, res0.

RLDEVENT_SEL, bits [12:8]

Defines the selected Resource Selector or pair of Resource Selectors. TRCCNTCTLR<n>.RLDEVENT.TYPE controls whether TRCCNTCTLR<n>.RLDEVENT.SEL is the index of a single Resource Selector, or the index of a pair of Resource Selectors.

Selects an event, that when it occurs causes a reload event for Counter <n>.

If an unimplemented Resource Selector is selected using this field, the behavior of the resource event is unpredictable, and the resource event might fire or might not fire when the resources are not in the Paused state.

Selecting Resource Selector pair 0 using this field is unpredictable, and the resource event might fire or might not fire when the resources are not in the Paused state.

The reset behavior of this field is:

- On a Trace unit reset, this field resets to an architecturally unknown value.

CNTEVENT_TYPE, bit [7]

Chooses the type of Resource Selector.

Selects an event, that when it occurs causes Counter <n> to decrement.

CNTEVENT_TYPE	**Meaning**

| 0b0 | A single Resource Selector. TRCCNTCTLR<n>.CNTEVENT.SEL[4:0] selects the single Resource Selector, from 0-31, used to activate the resource event. |
| 0b1 | A Boolean-combined pair of Resource Selectors. TRCCNTCTLR<n>.CNTEVENT.SEL[3:0] selects the Resource Selector pair, from 0-15, that has a Boolean function that is applied to it whose output is used to activate the resource event. TRCCNTCTLR<n>.CNTEVENT.SEL[4] is res0. |

The reset behavior of this field is:

- On a Trace unit reset, this field resets to an architecturally unknown value.

Bits [6:5]

Reserved, res0.

CNTEVENT_SEL, bits [4:0]

Defines the selected Resource Selector or pair of Resource Selectors. TRCCNTCTLR<n>.CNTEVENT.TYPE controls whether TRCCNTCTLR<n>.CNTEVENT.SEL is the index of a single Resource Selector, or the index of a pair of Resource Selectors.

Selects an event, that when it occurs causes Counter <n> to decrement.

If an unimplemented Resource Selector is selected using this field, the behavior of the resource event is unpredictable, and the resource event might fire or might not fire when the resources are not in the Paused state.

Selecting Resource Selector pair 0 using this field is unpredictable, and the resource event might fire or might not fire when the resources are not in the Paused state.

The reset behavior of this field is:

- On a Trace unit reset, this field resets to an architecturally unknown value.

Accessing TRCCNTCTLR<n>

Must be programmed if [TRCRSCTLR<a>](#).GROUP == 0b0010 and [TRCRSCTLR<a>](#).COUNTERS[n] == 1.

Writes are constrained unpredictable if the trace unit is not in the Idle state.

TRCCNTCTLR<n> can be accessed through the external debug interface:

Component	Offset	Instance
ETE	`0x150` + (4 * n)	TRCCNTCTLR<n>

This interface is accessible as follows:

- When OSLockStatus(), or !AllowExternalTraceAccess() or !IsTraceCorePowered(), accesses to this register generate an error response.
- Otherwise, accesses to this register are **RW**.