SPMEVTYPER<n>_EL0, System Performance Monitors Event Type Register, n = 0 - 63

The SPMEVTYPER<n>_EL0 characteristics are:

Purpose

With SPMEVFILTR<n>_EL0 and SPMEVFILT2R<n>_EL0, configures when event counter SPMEVCNTR<n>_EL0 in System PMU <s> increments.

The contents of this register are implementation defined. An Event Type Select Register typically contains:

- A field defining the event that the counter is responsive to, in the least-significant bits.
- Controls for per-counter filtering, such as by mode or state.
- Additional controls, such as for a per-counter state machine.

Configuration

This register is present only when FEAT_SPMU is implemented. Otherwise, direct accesses to SPMEVTYPER<n>_EL0 are undefined.

Attributes

SPMEVTYPER<n>_EL0 is a 64-bit register.

Field descriptions

63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32
IMPLEMENTATION DEFINED
IMPLEMENTATION DEFINED
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 6 5 4 3 2 1 0

IMPLEMENTATION DEFINED, bits [63:0]

implementation defined.

Accessing SPMEVTYPER<n>_EL0

To access SPMEVTYPER<n>_EL0 for System PMU <s>, set SPMSELR_EL0.SYSPMUSEL to s and SPMSELR_EL0.BANK to n[5:4].

SPMEVTYPER<n>_EL0 reads-as-zero and ignores writes if event counter <n> is not implemented by System PMU <s>.

Accesses to this register use the following encodings in the System register encoding space:

MRS <Xt>, SPMEVTYPER<m>_EL0 ; Where m = 0-15

op0	op1	CRn	CRm	op2
0b10	0b011	0b1110	0b001:m[3]	m[2:0]

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integer m = UInt(CRm<0>:op2<2:0>);

if PSTATE.EL == EL0 then
    if Halted() && HaveEL(EL3) && EDSCR.SDD == '1'
&& boolean IMPLEMENTATION_DEFINED "EL3 trap priority
when SDD == '1'" && MDCR_EL3.EnPM2 == '0' then
        UNDEFINED;
    elsif EL2Enabled() && HCR_EL2.<E2H,TGE> != '11'
&& IsFeatureImplemented(FEAT_FGT2) && HaveEL(EL3) &&
SCR_EL3.FGTEn2 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif EL2Enabled() && HCR_EL2.<E2H,TGE> != '11'
&& IsFeatureImplemented(FEAT_FGT2) &&
HDFGRTR2_EL2.nSPMEVTYPERn_EL0 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        X[t, 64] =
SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m];
elsif PSTATE.EL == EL1 then
    if Halted() && HaveEL(EL3) && EDSCR.SDD == '1'
&& boolean IMPLEMENTATION_DEFINED "EL3 trap priority
when SDD == '1'" && MDCR_EL3.EnPM2 == '0' then
        UNDEFINED;
    elsif EL2Enabled() &&
IsFeatureImplemented(FEAT_FGT2) && HaveEL(EL3) &&
SCR_EL3.FGTEn2 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif EL2Enabled() &&
IsFeatureImplemented(FEAT_FGT2) &&
HDFGRTR2_EL2.nSPMEVTYPERn_EL0 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        X[t, 64] =
```

```
SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m];
elsif PSTATE.EL == EL2 then
    if Halted() && HaveEL(EL3) && EDSCR.SDD == '1'
&& boolean IMPLEMENTATION_DEFINED "EL3 trap priority
when SDD == '1'" && MDCR_EL3.EnPM2 == '0' then
        UNDEFINED;
    elsif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        X[t, 64] =
SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m];
elsif PSTATE.EL == EL3 then
    X[t, 64] =
SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m];
```

MSR SPMEVTYPER<m>_EL0, <Xt> ; Where m = 0-15

op0	op1	CRn	CRm	op2
0b10	0b011	0b1110	0b001:m[3]	m[2:0]

```
integer m = UInt(CRm<0>:op2<2:0>);

if PSTATE.EL == EL0 then
    if Halted() && HaveEL(EL3) && EDSCR.SDD == '1'
&& boolean IMPLEMENTATION_DEFINED "EL3 trap priority
when SDD == '1'" && MDCR_EL3.EnPM2 == '0' then
        UNDEFINED;
    elsif EL2Enabled() && HCR_EL2.<E2H,TGE> != '11'
&& IsFeatureImplemented(FEAT_FGT2) && HaveEL(EL3) &&
SCR_EL3.FGTEn2 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif EL2Enabled() && HCR_EL2.<E2H,TGE> != '11'
&& IsFeatureImplemented(FEAT_FGT2) &&
HDFGWTR2_EL2.nSPMEVTYPERn_EL0 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m] = X[t, 64];
elsif PSTATE.EL == EL1 then
    if Halted() && HaveEL(EL3) && EDSCR.SDD == '1'
```

```
&& boolean IMPLEMENTATION_DEFINED "EL3 trap priority
when SDD == '1'" && MDCR_EL3.EnPM2 == '0' then
        UNDEFINED;
    elsif EL2Enabled() &&
IsFeatureImplemented(FEAT_FGT2) && HaveEL(EL3) &&
SCR_EL3.FGTEn2 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif EL2Enabled() &&
IsFeatureImplemented(FEAT_FGT2) &&
HDFGWTR2_EL2.nSPMEVTYPERn_EL0 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m] = X[t, 64];
elsif PSTATE.EL == EL2 then
    if Halted() && HaveEL(EL3) && EDSCR.SDD == '1'
&& boolean IMPLEMENTATION_DEFINED "EL3 trap priority
when SDD == '1'" && MDCR_EL3.EnPM2 == '0' then
        UNDEFINED;
    elsif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m] = X[t, 64];
elsif PSTATE.EL == EL3 then
    SPMEVTYPER_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m] = X[t, 64];
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