

## SPMEVCNTR<n>\_EL0, System Performance Monitors Event Count Register, n = 0 - 63

The SPMEVCNTR<n>\_EL0 characteristics are:

### Purpose

Event counter <n> in System PMU <s>, where n is 0 to 63.

### Configuration

This register is present only when FEAT\_SPMU is implemented. Otherwise, direct accesses to SPMEVCNTR<n>\_EL0 are undefined.

### Attributes

SPMEVCNTR<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
CNTR																															
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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

#### CNTR, bits [63:0]

Event counter n.

The number of implemented bits for SPMEVCNTR<n>\_EL0 is implementation defined. Unimplemented bits are res0.

The reset behavior of this field is:

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

### Accessing SPMEVCNTR<n>\_EL0

To access SPMEVCNTR<n>\_EL0 for System PMU <s>, set [SPMSELR\\_EL0](#).SYSPMUSEL to s and [SPMSELR\\_EL0](#).BANK to n[5:4].

SPMEVCNTR<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>, SPMEVCNTR<m>\_EL0 ; Where m = 0-15**

op0	op1	CRn	CRm	op2
0b10	0b011	0b1110	0b000: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) &&
    HDFGRTR2_EL2.nSPMEVCNTRn_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] =
            SPMEVCNTR_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.nSPMEVCNTRn_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] =
```

```

SPMEVCNTR_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m];
elseif 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;
    elseif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        X[t, 64] =
SPMEVCNTR_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m];
elseif PSTATE.EL == EL3 then
    X[t, 64] =
SPMEVCNTR_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m];

```

**MSR SPMEVCNTR<m>\_EL0, <Xt> ; Where m = 0-15**

op0	op1	CRn	CRm	op2
0b10	0b011	0b1110	0b000: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;
    elseif EL2Enabled() && HCR_EL2.<E2H,TGE> != '11'
    && IsFeatureImplemented(FEAT_FGT2) && HaveEL(EL3) &&
SCR_EL3.FGTEn2 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elseif EL2Enabled() && HCR_EL2.<E2H,TGE> != '11'
    && IsFeatureImplemented(FEAT_FGT2) &&
HDFGWTR2_EL2.nSPMEVCNTRn_EL0 == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elseif HaveEL(EL3) && MDCR_EL3.EnPM2 == '0' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        SPMEVCNTR_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m] = X[t, 64];
elseif PSTATE.EL == EL1 then
    if Halted() && HaveEL(EL3) && EDSCR.SDD == '1'

```

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&& 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.nSPMEVCNTRn_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
            SPMEVCNTR_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
                SPMEVCNTR_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m] = X[t, 64];
    elsif PSTATE.EL == EL3 then
        SPMEVCNTR_EL0[UInt(SPMSELR_EL0.SYSPMUSEL),
(UInt(SPMSELR_EL0.BANK) * 16) + m] = X[t, 64];

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