MPAMSM_EL1, MPAM Streaming Mode Register

The MPAMSM_EL1 characteristics are:

Purpose

Holds information to generate MPAM labels for memory requests that are:

- Issued due to the execution of SME load and store instructions.
- Issued when the PE is in Streaming SVE mode due to the execution of SVE and SIMD&FP load and store instructions and SVE prefetch instructions.

If an implementation uses a shared SMCU, then the MPAM labels in this register have precedence over the labels in MPAM0_EL1, MPAM1_EL1, MPAM2_EL2, and MPAM3_EL3.

If an implementation includes an SMCU that is not shared with other PEs, then it is implementation defined whether the MPAM labels in this register have precedence over the labels in MPAM0_EL1, MPAM1_EL1, MPAM2_EL2, and MPAM3_EL3.

The MPAM labels in this register are only used if MPAM1_EL1.MPAMEN is 1.

For memory requests issued from EL0, the MPAM PARTID in this register is virtual and mapped into a physical PARTID when all of the following are true:

- EL2 is implemented and enabled in the current Security state, and HCR_EL2.{E2H, TGE} is not {1, 1}.
- The MPAM virtualization option is implemented and MPAMHCR_EL2.EL0_VPMEN is 1.

For memory requests issued from EL1, the MPAM PARTID in this register is virtual and mapped into a physical PARTID when all of the following are true:

- EL2 is implemented and enabled in the current Security state.
- The MPAM virtualization option is implemented and MPAMHCR_EL2.EL1_VPMEN is 1.

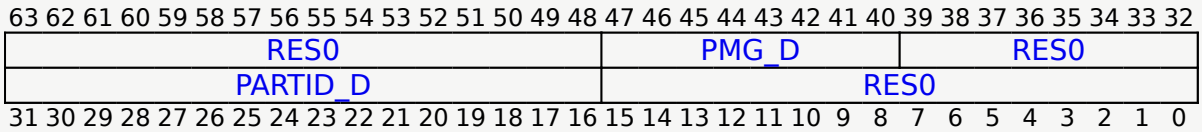
Configuration

This register is present only when FEAT_MPAM is implemented and FEAT_SME is implemented. Otherwise, direct accesses to MPAMSM_EL1 are undefined.

Attributes

MPAMSM_EL1 is a 64-bit register.

Field descriptions



Bits [63:48]

Reserved, res0.

PMG_D, bits [47:40]

Performance monitoring group property for PARTID_D.

The reset behavior of this field is:

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

Bits [39:32]

Reserved, res0.

PARTID_D, bits [31:16]

Partition ID for requests issued due to the execution at any Exception level of SME load and store instructions and, when the PE is in Streaming SVE mode, SVE and SIMD&FP load and store instructions and SVE prefetch instructions.

The reset behavior of this field is:

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

Bits [15:0]

Reserved, res0.

Accessing MPAMSM_EL1

None of the fields in this register are permitted to be cached in a TLB.

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

MRS <Xt>, MPAMSM_EL1

op0	op1	CRn	CRm	op2
0b11	0b000	0b1010	0b0101	0b011

```
if PSTATE.EL == EL0 then
    UNDEFINED;
elsif PSTATE.EL == EL1 then
    if HaveEL(EL3) && MPAM3_EL3.TRAPLOWER == '1' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    elsif EL2Enabled() && MPAM2_EL2.EnMPAMSM == '0'
then
        AArch64.SystemAccessTrap(EL2, 0x18);
    else
        X[t, 64] = MPAMSM_EL1;
elsif PSTATE.EL == EL2 then
    if HaveEL(EL3) && MPAM3_EL3.TRAPLOWER == '1' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        X[t, 64] = MPAMSM_EL1;
elsif PSTATE.EL == EL3 then
    X[t, 64] = MPAMSM_EL1;
```

MSR MPAMSM_EL1, <Xt>

op0	op1	CRn	CRm	op2
0b11	0b000	0b1010	0b0101	0b011

```
if PSTATE.EL == EL0 then
    UNDEFINED;
elsif PSTATE.EL == EL1 then
    if HaveEL(EL3) && MPAM3_EL3.TRAPLOWER == '1' then
        if Halted() && EDSCR.SDD == '1' then
```

```
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    elsif EL2Enabled() && MPAM2_EL2.EnMPAMSM == '0'
then
        AArch64.SystemAccessTrap(EL2, 0x18);
    else
        MPAMSM_EL1 = X[t, 64];
elsif PSTATE.EL == EL2 then
    if HaveEL(EL3) && MPAM3_EL3.TRAPLOWER == '1' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    else
        MPAMSM_EL1 = X[t, 64];
elsif PSTATE.EL == EL3 then
    MPAMSM_EL1 = X[t, 64];
```

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