RNDRRS, Reseeded Random Number

The RNDRRS characteristics are:

Purpose

Reseeded Random Number. Returns a 64-bit random number which is reseeded from the True Random Number source immediately before the read of the random number.

If the hardware returns a genuine random number, PSTATE.NZCV is set to `0b0000`.

If the instruction cannot return a genuine random number in a reasonable period of time, PSTATE.NZCV is set to `0b0100` and the data value returned is 0.

When FEAT_RNG_TRAP is implemented and SCR_EL3.TRNDR is 1, reads of this register are trapped to EL3.

Configuration

This register is present only when FEAT_RNG is implemented or FEAT_RNG_TRAP is implemented. Otherwise, direct accesses to RNDRRS are undefined.

Attributes

RNDRRS 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
RNDRRS																															
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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

RNDRRS, bits [63:0]

Reseeded Random Number. Returns a 64-bit Random Number which is reseeded from the True Random Number source immediately before this read.

The reset behavior of this field is:

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

Accessing RNDRRS

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

MRS <Xt>, RNDRRS

op0	op1	CRn	CRm	op2
0b11	0b011	0b0010	0b0100	0b001

```
if PSTATE.EL == EL0 then
    if IsFeatureImplemented(FEAT_RNG_TRAP) &&
SCR_EL3.TRNDR == '1' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    elsif !IsFeatureImplemented(FEAT_RNG) then
        UNDEFINED;
    else
        X[t, 64] = RNDRRS;
elsif PSTATE.EL == EL1 then
    if IsFeatureImplemented(FEAT_RNG_TRAP) &&
SCR_EL3.TRNDR == '1' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    elsif !IsFeatureImplemented(FEAT_RNG) then
        UNDEFINED;
    else
        X[t, 64] = RNDRRS;
elsif PSTATE.EL == EL2 then
    if IsFeatureImplemented(FEAT_RNG_TRAP) &&
SCR_EL3.TRNDR == '1' then
        if Halted() && EDSCR.SDD == '1' then
            UNDEFINED;
        else
            AArch64.SystemAccessTrap(EL3, 0x18);
    elsif !IsFeatureImplemented(FEAT_RNG) then
        UNDEFINED;
    else
        X[t, 64] = RNDRRS;
elsif PSTATE.EL == EL3 then
    if IsFeatureImplemented(FEAT_RNG_TRAP) &&
SCR_EL3.TRNDR == '1' then
        AArch64.SystemAccessTrap(EL3, 0x18);
    elsif !IsFeatureImplemented(FEAT_RNG) then
```

```
            UNDEFINED;
        else
            X[t, 64] = RNDRRS;
```

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