CNTVCT_EL0, Counter-timer Virtual Count Register

The CNTVCT_EL0 characteristics are:

Purpose

Holds the 64-bit virtual count value. The virtual count value is equal to the physical count value minus the virtual offset visible in CNTVOFF_EL2.

Configuration

AArch64 System register CNTVCT_EL0 bits [63:0] are architecturally mapped to AArch32 System register CNTVCT[63:0].

The value of this register is the same as the value of CNTPCT_EL0 in the following conditions:

- When EL2 is not implemented.
- When EL2 is implemented, HCR_EL2.E2H is 1, and this register is read from EL2.
- When EL2 is implemented and enabled in the current Security state, HCR_EL2.{E2H, TGE} is {1, 1}, and this register is read from EL0 or EL2.

All reads to the CNTVCT_EL0 occur in program order relative to reads to CNTVCTSS_EL0 or CNTVCT_EL0.

Attributes

CNTVCT_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
Virtual count value
Virtual count value
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

Bits [63:0]

Virtual count value.

The reset behavior of this field is:

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

Accessing CNTVCT_EL0

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

MRS <Xt>, CNTVCT_EL0

op0	op1	CRn	CRm	op2
0b11	0b011	0b1110	0b0000	0b010

```
if PSTATE.EL == EL0 then
    if !(EL2Enabled() && HCR_EL2.<E2H,TGE> == '11')
&& CNTKCTL_EL1.EL0VCTEN == '0' then
        if EL2Enabled() && HCR_EL2.TGE == '1' then
            AArch64.SystemAccessTrap(EL2, 0x18);
        else
            AArch64.SystemAccessTrap(EL1, 0x18);
    elsif EL2Enabled() && HCR_EL2.<E2H,TGE> == '11'
&& CNTHCTL_EL2.EL0VCTEN == '0' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    elsif EL2Enabled() && HCR_EL2.<E2H,TGE> != '11'
&& CNTHCTL_EL2.EL1TVCT == '1' then
        AArch64.SystemAccessTrap(EL2, 0x18);
    else
        if HaveEL(EL2) && (!EL2Enabled() ||
HCR_EL2.<E2H,TGE> != '11') then
            X[t, 64] = PhysicalCountInt() -
CNTVOFF_EL2;
        else
            X[t, 64] = PhysicalCountInt();
elsif PSTATE.EL == EL1 then
    if EL2Enabled() && CNTHCTL_EL2.EL1TVCT == '1'
then
        AArch64.SystemAccessTrap(EL2, 0x18);
    else
        if HaveEL(EL2) then
            X[t, 64] = PhysicalCountInt() -
CNTVOFF_EL2;
        else
            X[t, 64] = PhysicalCountInt();
elsif PSTATE.EL == EL2 then
    if HCR_EL2.E2H == '0' then
        X[t, 64] = PhysicalCountInt() - CNTVOFF_EL2;
    else
        X[t, 64] = PhysicalCountInt();
elsif PSTATE.EL == EL3 then
    if HaveEL(EL2) && !ELUsingAArch32(EL2) then
        X[t, 64] = PhysicalCountInt() - CNTVOFF_EL2;
```

```
    elsif HaveEL(EL2) && ELUsingAArch32(EL2) then
        X[t, 64] = PhysicalCountInt() - CNTVOFF;
    else
        X[t, 64] = PhysicalCountInt();
```

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