

## LDFF1D (scalar plus scalar)

Contiguous load first-fault doublewords to vector (scalar index)

Contiguous load with first-faulting behavior of doublewords to elements of a vector register from the memory address generated by a 64-bit scalar base and scalar index which is multiplied by 8 and added to the base address. After each element access the index value is incremented, but the index register is not updated. Inactive elements will not cause a read from Device memory or signal a fault, and are set to zero in the destination vector.

This instruction is illegal when executed in Streaming SVE mode, unless FEAT\_SME\_FA64 is implemented and enabled.

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
1	0	1	0	0	1	0	1	1	1	1			Rm			0	1	1	Pg				Rn					Zt			
dtype<0>										dtype<0>																					

dtype<dtype<0>

**LDFF1D { <Zt>.D }, <Pg>/Z, [<Xn|SP>{, <Xm>, LSL #3}]**

```
if !HaveSVE() then UNDEFINED;
integer t = UInt(Zt);
integer n = UInt(Rn);
integer m = UInt(Rm);
integer g = UInt(Pg);
constant integer esize = 64;
constant integer msize = 64;
boolean unsigned = TRUE;
```

## Assembler Symbols

- <Zt> Is the name of the scalable vector register to be transferred, encoded in the "Zt" field.
- <Pg> Is the name of the governing scalable predicate register P0-P7, encoded in the "Pg" field.
- <Xn|SP> Is the 64-bit name of the general-purpose base register or stack pointer, encoded in the "Rn" field.
- <Xm> Is the optional 64-bit name of the general-purpose offset register, defaulting to XZR, encoded in the "Rm" field.

## Operation

```
CheckNonStreamingSVEEnabled();
constant integer VL = CurrentVL;
constant integer PL = VL DIV 8;
constant integer elements = VL DIV esize;
bits(64) base;
bits(PL) mask = P[g, PL];
bits(VL) result;
```

```

bits(VL) orig = Z[t, VL];
bits(msize) data;
bits(64) offset;
constant integer mbytes = msize DIV 8;
boolean fault = FALSE;
boolean faulted = FALSE;
boolean unknown = FALSE;
boolean contiguous = TRUE;
boolean tagchecked = TRUE;
AccessDescriptor accdesc = CreateAccDescSVEFF(contiguous, tagchecked);

if !AnyActiveElement(mask, esize) then
    if n == 31 && ConstrainUnpredictableBool(Unpredictable\_CHECKSPNONEA
        CheckSPAlignment());
else
    if n == 31 then CheckSPAlignment();
    base = if n == 31 then SP[] else X[n, 64];
    offset = X[m, 64];

assert accdesc.first;

for e = 0 to elements-1
    if ActivePredicateElement(mask, e, esize) then
        bits(64) addr = base + (UInt(offset) + e) * mbytes;
        if accdesc.first then
            // Mem[] will not return if a fault is detected for the first
            data = Mem[addr, mbytes, accdesc];
            accdesc.first = FALSE;
        else
            // MemNF[] will return fault=TRUE if access is not performed
            (data, fault) = MemNF[addr, mbytes, accdesc];
        else
            (data, fault) = (Zeros(msize), FALSE);

// FFR elements set to FALSE following a suppressed access/fault
faulted = faulted || fault;
if faulted then
    ElemFFR[e, esize] = '0';

// Value becomes CONSTRAINED UNPREDICTABLE after an FFR element is
unknown = unknown || ElemFFR[e, esize] == '0';
if unknown then
    if !fault && ConstrainUnpredictableBool(Unpredictable\_SVELDNFDA
        Elem[result, e, esize] = Extend(data, esize, unsigned);
    elseif ConstrainUnpredictableBool(Unpredictable\_SVELDNFZERO) then
        Elem[result, e, esize] = Zeros(esize);
    else // merge
        Elem[result, e, esize] = Elem[orig, e, esize];
else
    Elem[result, e, esize] = Extend(data, esize, unsigned);

Z[t, VL] = result;

```

[Base  
Instructions](#)

[SIMD&FP  
Instructions](#)

[SVE  
Instructions](#)

[SME  
Instructions](#)

[Index by  
Encoding](#)

[Sh  
Pseud](#)

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