SVDOT (2-way)

Multi-vector signed integer vertical dot-product by indexed element

The signed integer vertical dot product instruction computes the vertical dot product of the corresponding two signed 16-bit integer values held in the two first source vectors and two signed 16-bit integer values in the corresponding indexed 32-bit element of the second source vector. The widened dot product results are destructively added to the corresponding 32-bit element of the ZA single-vector groups.

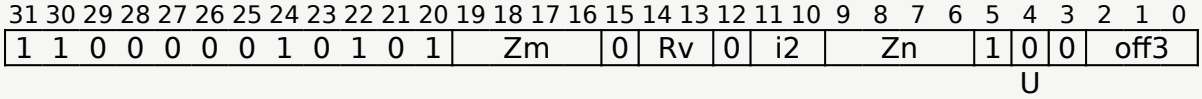
The groups within the second source vector are specified using an immediate element index which selects the same group position within each 128-bit vector segment. The index range is from 0 to 3, encoded in 2 bits.

The vector numbers forming the single-vector group within each half of the ZA array are selected by the sum of the vector select register and immediate offset, modulo half the number of ZA array vectors.

The vector group symbol VGx2 indicates that the ZA operand consists of two ZA single-vector groups. The vector group symbol is preferred for disassembly, but optional in assembler source code.

This instruction is unpredicated.

SME2
(FEAT_SME2)




```
SVDOT ZA.S[<Wv>, <offs>{, VGx2}], { <Zn1>.H-<Zn2>.H }, <Zm>.H[<index>
```

```
if !HaveSME2() then UNDEFINED;
integer v = UInt('010':Rv);
constant integer esize = 32;
integer n = UInt(Zn:'0');
integer m = UInt('0':Zm);
integer offset = UInt(off3);
integer index = UInt(i2);
```

Assembler Symbols

<Wv>	Is the 32-bit name of the vector select register W8-W11, encoded in the "Rv" field.
<offs>	Is the vector select offset, in the range 0 to 7, encoded in the "off3" field.
<Zn1>	Is the name of the first scalable vector register of a multi-vector sequence, encoded as "Zn" times 2.

<Zn2>	Is the name of the second scalable vector register of a multi-vector sequence, encoded as "Zn" times 2 plus 1.
<Zm>	Is the name of the second source scalable vector register Z0-Z15, encoded in the "Zm" field.
<index>	Is the immediate index of a group of two 16-bit elements within each 128-bit vector segment, in the range 0 to 3, encoded in the "i2" field.

Operation

```
CheckStreamingSVEAndZAEnabled();
constant integer VL = CurrentVL;
constant integer elements = VL DIV esize;
integer vectors = VL DIV 8;
integer vstride = vectors DIV 2;
integer eltspersegment = 128 DIV esize;
bits(32) vbase = X[v, 32];
integer vec = (UInt(vbase) + offset) MOD vstride;
bits(VL) operand2 = Z[m, VL];
bits(VL) result;

for r = 0 to 1
    bits(VL) operand3 = ZAvector[vec, VL];
    for e = 0 to elements-1
        integer segmentbase = e - (e MOD eltspersegment);
        integer s = segmentbase + index;
        bits(esize) sum = Elem[operand3, e, esize];
        for i = 0 to 1
            bits(VL) operand1 = Z[n+i, VL];
            integer element1 = SInt(Elem[operand1, 2 * e + r, esize DIV
            integer element2 = SInt(Elem[operand2, 2 * s + i, esize DIV
            sum = sum + element1 * element2;
        Elem[result, e, esize] = sum;
    ZAvector[vec, VL] = result;
    vec = vec + vstride;
```


Internal version only: isa v33.64, AdvSIMD v29.12, pseudocode no_diffs_2023_09_RC2, sve v2023-06_rel ; Build timestamp: 2023-09-18T17:56