MOVA (vector to tile, four registers)

Move four vector registers to four ZA tile slices

The instruction operates on four consecutive horizontal or vertical slices within a named ZA tile of the specified element size.

The consecutive slice numbers within the tile are selected starting from the sum of the slice index register and immediate offset, modulo the number of such elements in a vector. The immediate offset is a multiple of 4 in the range 0 to the number of elements in a 128-bit vector segment minus 4.

This instruction is unpredicated.

This instruction is used by the alias MOV (vector to tile, four registers).

It has encodings from 4 classes: 8-bit , 16-bit , 32-bit and 64-bit

8-bit
(FEAT_SME2)

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	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	V	Rs			0	0	1	Zn				0	0	0	0	off2
								size<1>	size<0>																						

MOVA ZA0<HV>.B[<Ws>, <offs1>:<offs4>], { <Zn1>.B–<Zn4>.B }

```
if !HaveSME2() then UNDEFINED;
integer s = UInt('011':Rs);
constant integer nreg = 4;
constant integer esize = 8;
integer n = UInt(Zn:'00');
integer d = 0;
integer offset = UInt(off2:'00');
boolean vertical = V == '1';
```

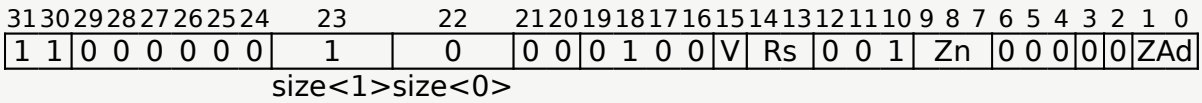
16-bit
(FEAT_SME2)

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	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	V	Rs			0	0	1	Zn				0	0	0	ZAd	o1
								size<1>	size<0>																						

MOVA <ZAd><HV>.H[<Ws>, <offs1>:<offs4>], { <Zn1>.H–<Zn4>.H }

```
if !HaveSME2() then UNDEFINED;
integer s = UInt('011':Rs);
constant integer nreg = 4;
constant integer esize = 16;
integer n = UInt(Zn:'00');
integer d = UInt(ZAd);
integer offset = UInt(o1:'00');
boolean vertical = V == '1';
```

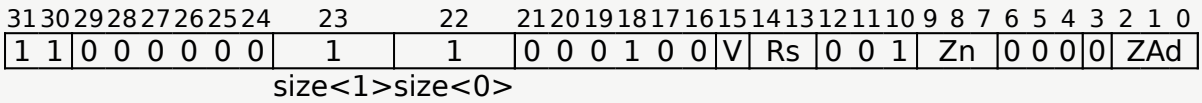
32-bit
(FEAT_SME2)



MOVA <ZAd><HV>.S[<Ws>, <offs1>:<offs4>], { <Zn1>.S-<Zn4>.S }

```
if !HaveSME2() then UNDEFINED;
integer s = UInt('011':Rs);
constant integer nreg = 4;
constant integer esize = 32;
integer n = UInt(Zn:'00');
integer d = UInt(ZAd);
integer offset = 0;
boolean vertical = V == '1';
```

64-bit
(FEAT_SME2)



MOVA <ZAd><HV>.D[<Ws>, <offs1>:<offs4>], { <Zn1>.D-<Zn4>.D }

```
if !HaveSME2() then UNDEFINED;
integer s = UInt('011':Rs);
constant integer nreg = 4;
constant integer esize = 64;
integer n = UInt(Zn:'00');
integer d = UInt(ZAd);
integer offset = 0;
boolean vertical = V == '1';
```

Assembler Symbols

<ZAd> For the 16-bit variant: is the name of the ZA tile ZA0-ZA1 to be accessed, encoded in the "ZAd" field.

For the 32-bit variant: is the name of the ZA tile ZA0-ZA3 to be accessed, encoded in the "ZAd" field.

For the 64-bit variant: is the name of the ZA tile ZA0-ZA7 to be accessed, encoded in the "ZAd" field.

<HV> Is the horizontal or vertical slice indicator, encoded in “V”:

V	<HV>
0	H
1	V

<Ws>	Is the 32-bit name of the slice index register W12-W15, encoded in the "Rs" field.
<offs1>	For the 8-bit variant: is the slice index offset, pointing to first of four consecutive slices, encoded as "off2" field times 4. For the 16-bit variant: is the slice index offset, pointing to first of four consecutive slices, encoded as "o1" field times 4. For the 32-bit and 64-bit variant: is the slice index offset, pointing to first of four consecutive slices, with implicit value 0.
<offs4>	For the 8-bit variant: is the slice index offset, pointing to last of four consecutive slices, encoded as "off2" field times 4 plus 3. For the 16-bit variant: is the slice index offset, pointing to last of four consecutive slices, encoded as "o1" field times 4 plus 3. For the 32-bit and 64-bit variant: is the slice index offset, pointing to last of four consecutive slices, with implicit value 3.
<Zn1>	Is the name of the first scalable vector register of a multi-vector sequence, encoded as "Zn" times 4.
<Zn4>	Is the name of the fourth scalable vector register of a multi-vector sequence, encoded as "Zn" times 4 plus 3.

Operation

```
CheckStreamingSVEAndZAEnabled();
constant integer VL = CurrentVL;
if nreg == 4 && esize == 64 && VL == 128 then UNDEFINED;
integer slices = VL DIV esize;
bits(32) index = X[s, 32];
integer slice = ((UInt(index) - (UInt(index) MOD nreg)) + offset) MOD sl

for r = 0 to nreg-1
    bits(VL) result = Z[n + r, VL];
    ZAslice[d, esize, vertical, slice + r, VL] = result;
```

Operational information

If PSTATE.DIT is 1:

- The execution time of this instruction is independent of:
  - The values of the data supplied in any of its registers.
  - The values of the NZCV flags.
- The response of this instruction to asynchronous exceptions does not vary based on:
  - The values of the data supplied in any of its registers.

- The values of the NZCV flags.

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