MOVA (vector to tile, single)

Move vector register to ZA tile slice

The instruction operates on individual horizontal or vertical slices within a named ZA tile of the specified element size. The slice number within the tile is selected by the sum of the slice index register and immediate offset, modulo the number of such elements in a vector. The immediate offset is in the range 0 to the number of elements in a 128-bit vector segment minus 1.

Inactive elements in the destination slice remain unmodified.

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

It has encodings from 5 classes: 8-bit , 16-bit , 32-bit , 64-bit and 128-bit

8-bit

(FEAT_SME)

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	0	0	0	V	Rs			Pg			Zn				0	off4			
								size<1>	size<0>						Q																

MOVA ZA0<HV>.B[<Ws>, <offs>], <Pg>/M, <Zn>.B

```
if !HaveSME() then UNDEFINED;
integer g = UInt(Pg);
integer s = UInt('011':Rs);
integer n = UInt(Zn);
integer d = 0;
integer offset = UInt(off4);
constant integer esize = 8;
boolean vertical = V == '1';
```

16-bit

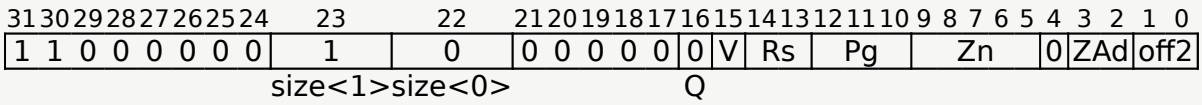
(FEAT_SME)

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	0	0	0	V	Rs			Pg			Zn				0	ZAd		off3	
								size<1>	size<0>						Q																

MOVA <ZAd><HV>.H[<Ws>, <offs>], <Pg>/M, <Zn>.H

```
if !HaveSME() then UNDEFINED;
integer g = UInt(Pg);
integer s = UInt('011':Rs);
integer n = UInt(Zn);
integer d = UInt(ZAd);
integer offset = UInt(off3);
constant integer esize = 16;
boolean vertical = V == '1';
```

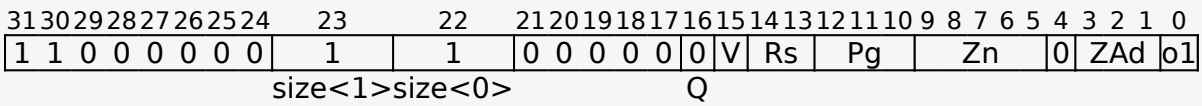
32-bit
(FEAT_SME)



MOVA <ZAd><HV>.S[<Ws>, <offs>], <Pg>/M, <Zn>.S

```
if !HaveSME() then UNDEFINED;
integer g = UInt(Pg);
integer s = UInt('011':Rs);
integer n = UInt(Zn);
integer d = UInt(ZAd);
integer offset = UInt(off2);
constant integer esize = 32;
boolean vertical = V == '1';
```

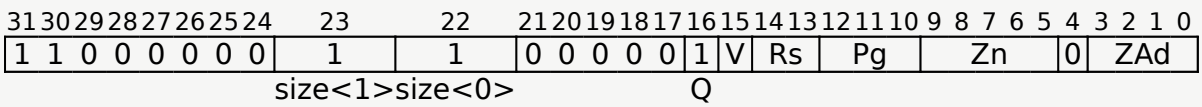
64-bit
(FEAT_SME)



MOVA <ZAd><HV>.D[<Ws>, <offs>], <Pg>/M, <Zn>.D

```
if !HaveSME() then UNDEFINED;
integer g = UInt(Pg);
integer s = UInt('011':Rs);
integer n = UInt(Zn);
integer d = UInt(ZAd);
integer offset = UInt(o1);
constant integer esize = 64;
boolean vertical = V == '1';
```

128-bit
(FEAT_SME)



MOVA <ZAd><HV>.Q[<Ws>, <offs>], <Pg>/M, <Zn>.Q

```
if !HaveSME() then UNDEFINED;
integer g = UInt(Pg);
integer s = UInt('011':Rs);
integer n = UInt(Zn);
integer d = UInt(ZAd);
integer offset = 0;
constant integer esize = 128;
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.

For the 128-bit variant: is the name of the ZA tile ZA0-ZA15 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.

<offs>

For the 8-bit variant: is the slice index offset, in the range 0 to 15, encoded in the "off4" field.

For the 16-bit variant: is the slice index offset, in the range 0 to 7, encoded in the "off3" field.

For the 32-bit variant: is the slice index offset, in the range 0 to 3, encoded in the "off2" field.

For the 64-bit variant: is the slice index offset, in the range 0 to 1, encoded in the "o1" field.

For the 128-bit variant: is the slice index offset 0.

<Pg>

Is the name of the governing scalable predicate register P0-P7, encoded in the "Pg" field.

<Zn>

Is the name of the source scalable vector register, encoded in the "Zn" field.

Operation

```
CheckStreamingSVEAndZAEnabled();
constant integer VL = CurrentVL;
constant integer PL = VL DIV 8;
constant integer dim = VL DIV esize;
bits(PL) mask = P[g, PL];
bits(VL) operand = Z[n, VL];
bits(32) index = X[s, 32];
integer  slice = (UInt(index) + offset) MOD dim;
bits(VL) result = ZAslice[d, esize, vertical, slice, VL];
```

```
for e = 0 to dim-1
    bits(esize) element = Elem[operand, e, esize];
    if ActivePredicateElement(mask, e, esize) then
        Elem[result, e, esize] = element;

ZAslice[d, esize, vertical, slice, 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 operand registers when its governing predicate register contains the same value for each execution.
  - 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 operand registers when its governing predicate register contains the same value for each execution.
  - The values of the NZCV flags.

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