ZERO (tile)

Zero a list of 64-bit element ZA tiles

Zeroes all bytes within each of the up to eight listed 64-bit element tiles named ZA0.D to ZA7.D, leaving the other 64-bit element tiles unmodified.

This instruction does not require the PE to be in Streaming SVE mode, and it is expected that this instruction will not experience a significant slowdown due to contention with other PEs that are executing in Streaming SVE mode.

For programmer convenience an assembler must also accept the names of 32-bit, 16-bit, and 8-bit element tiles which are converted into the corresponding set of 64-bit element tiles.

In accordance with the architecturally defined mapping between different element size tiles:

- Zeroing the 8-bit element tile name ZA0.B, or the entire array name ZA, is equivalent to zeroing all eight 64-bit element tiles named ZA0.D to ZA7.D.
- Zeroing the 16-bit element tile name ZA0.H is equivalent to zeroing 64-bit element tiles named ZA0.D, ZA2.D, ZA4.D, and ZA6.D.
- Zeroing the 16-bit element tile name ZA1.H is equivalent to zeroing 64-bit element tiles named ZA1.D, ZA3.D, ZA5.D, and ZA7.D.
- Zeroing the 32-bit element tile name ZA0.S is equivalent to zeroing 64-bit element tiles named ZA0.D and ZA4.D.
- Zeroing the 32-bit element tile name ZA1.S is equivalent to zeroing 64-bit element tiles named ZA1.D and ZA5.D.
- Zeroing the 32-bit element tile name ZA2.S is equivalent to zeroing 64-bit element tiles named ZA2.D and ZA6.D.
- Zeroing the 32-bit element tile name ZA3.S is equivalent to zeroing 64-bit element tiles named ZA3.D and ZA7.D.

The preferred disassembly of this instruction uses the shortest list of tile names that represent the encoded immediate mask.

For example:

- An immediate which encodes 64-bit element tiles ZA0.D, ZA1.D, ZA4.D, and ZA5.D is disassembled as {ZA0.S, ZA1.S}.
- An immediate which encodes 64-bit element tiles ZA0.D, ZA2.D, ZA4.D, and ZA6.D is disassembled as {ZA0.H}.
- An all-ones immediate is disassembled as {ZA}.
- An all-zeros immediate is disassembled as an empty list { }.

SME
(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	1	0	0	0	0	0	0	0	0	0	0	0	imm8							

```
    ZERO { <mask> }

if !HaveSME() then UNDEFINED;
bits(8) mask = imm8;
constant integer esize = 64;
```

Assembler Symbols

<mask>	Is a list of up to eight 64-bit element tile names separated by commas, encoded in the "imm8" field.

Operation

```
CheckSMEAndZAEnabled();
constant integer SVL = CurrentSVL;
constant integer dim = SVL DIV esize;
bits(dim*dim*esize) result = Zeros(dim*dim*esize);

if HaveTME() && TSTATE.depth > 0 then
    FailTransaction(TMFailure_ERR, FALSE);

for i = 0 to 7
    if mask<i> == '1' then ZAtile[i, esize, dim*dim*esize] = 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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