

SUNPKHI, SUNPKLO

Signed unpack and extend half of vector

Unpack elements from the lowest or highest half of the source vector and then sign-extend them to place in elements of twice their size within the destination vector. This instruction is unpredicated.

It has encodings from 2 classes: [High half](#) and [Low half](#)

High half

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
0	0	0	0	0	1	0	1	size	1	1	0	0	0	1	0	0	1	1	1	0					Zn					Zd	
U H																															

SUNPKHI [<Zd>.<T>](#), [<Zn>.<Tb>](#)

```
if !HaveSVE() && !HaveSME() then UNDEFINED;
if size == '00' then UNDEFINED;
constant integer esize = 8 << UInt(size);
integer n = UInt(Zn);
integer d = UInt(Zd);
boolean unsigned = FALSE;
boolean hi = TRUE;
```

Low half

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
0	0	0	0	0	1	0	1	size	1	1	0	0	0	0	0	0	1	1	1	0					Zn					Zd	
U H																															

SUNPKLO [<Zd>.<T>](#), [<Zn>.<Tb>](#)

```
if !HaveSVE() && !HaveSME() then UNDEFINED;
if size == '00' then UNDEFINED;
constant integer esize = 8 << UInt(size);
integer n = UInt(Zn);
integer d = UInt(Zd);
boolean unsigned = FALSE;
boolean hi = FALSE;
```

Assembler Symbols

<Zd> Is the name of the destination scalable vector register, encoded in the "Zd" field.

<T>

Is the size specifier, encoded in “size”:

size	<T>
00	RESERVED
01	H
10	S
11	D

<Zn>

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

<Tb>

Is the size specifier, encoded in “size”:

size	<Tb>
00	RESERVED
01	B
10	H
11	S

Operation

```
CheckSVEEnabled();  
constant integer VL = CurrentVL;  
constant integer PL = VL DIV 8;  
constant integer elements = VL DIV esize;  
constant integer hsize = esize DIV 2;  
bits(VL) operand = Z[n, VL];  
bits(VL) result;  
  
for e = 0 to elements-1  
    bits(hsize) element = if hi then Elem[operand, e + elements, hsize]  
        Elem[result, e, esize] = Extend(element, esize, unsigned);  
  
Z[d, VL] = result;
```

Operational information

If FEAT_SVE2 is implemented or FEAT_SME is implemented, then 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.

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

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