

## AUTIB, AUTIB1716, AUTIBSP, AUTIBZ, AUTIZB

Authenticate Instruction address, using key B. This instruction authenticates an instruction address, using a modifier and key B.

The address is:

- In the general-purpose register that is specified by <Xd> for AUTIB and AUTIZB.
- In X17, for AUTIB1716.
- In X30, for AUTIBSP and AUTIBZ.

The modifier is:

- In the general-purpose register or stack pointer that is specified by <Xn|SP> for AUTIB.
- The value zero, for AUTIZB and AUTIBZ.
- In X16, for AUTIB1716.
- In SP, for AUTIBSP.

If the authentication passes, the upper bits of the address are restored to enable subsequent use of the address. For information on behavior if the authentication fails, see [Faulting on pointer authentication](#).

It has encodings from 2 classes: [Integer](#) and [System](#)

### Integer

(FEAT\_PAuth)

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	1	1	0	1	0	1	1	0	0	0	0	0	1	0	0	Z	1	0	1	Rn					Rd				

### AUTIB (Z == 0)

AUTIB <Xd>, <Xn|SP>

### AUTIZB (Z == 1 && Rn == 11111)

AUTIZB <Xd>

```
boolean source_is_sp = FALSE;
integer d = UInt(Rd);
integer n = UInt(Rn);

if !IsFeatureImplemented(FEAT_PAuth) then
    UNDEFINED;

if Z == '0' then // AUTIB
    if n == 31 then source_is_sp = TRUE;
else // AUTIZB
    if n != 31 then UNDEFINED;
```

## System

### (FEAT\_PAAuth)

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	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	x	1	1	1	x	1	1	1	1	1
												CRm				op2															

### AUTIB1716 (CRm == 0001 && op2 == 110)

AUTIB1716

### AUTIBSP (CRm == 0011 && op2 == 111)

AUTIBSP

### AUTIBZ (CRm == 0011 && op2 == 110)

AUTIBZ

```
integer d;
integer n;
boolean source_is_sp = FALSE;

case CRm:op2 of
  when '0011 110'    // AUTIBZ
    d = 30;
    n = 31;
  when '0011 111'    // AUTIBSP
    d = 30;
    source_is_sp = TRUE;
  when '0001 110'    // AUTIB1716
    d = 17;
    n = 16;
  when '0001 000' SEE "PACIA";
  when '0001 010' SEE "PACIB";
  when '0001 100' SEE "AUTIA";
  when '0011 00x' SEE "PACIA";
  when '0011 01x' SEE "PACIB";
  when '0011 10x' SEE "AUTIA";
  when '0000 111' SEE "XPACLRI";
  otherwise SEE "HINT";
```

## Assembler Symbols

- <Xd> Is the 64-bit name of the general-purpose destination register, encoded in the "Rd" field.
- <Xn|SP> Is the 64-bit name of the general-purpose source register or stack pointer, encoded in the "Rn" field.

Operation

```
if IsFeatureImplemented(FEAT_PAuth) then
  if source_is_sp then
    X[d, 64] = AuthIB(X[d, 64], SP[], FALSE);
  else
    X[d, 64] = AuthIB(X[d, 64], X[n, 64], FALSE);
```

[Base Instructions](#)

[SIMD&FP Instructions](#)

[SVE Instructions](#)

[SME Instructions](#)

[Index by Encoding](#)

[Sh](#)  
[Pseu](#)

Internal version only: isa v33.64, AdvSIMD v29.12, pseudocode  
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