BLRAA, BLRAAZ, BLRAB, BLRABZ

Branch with Link to Register, with pointer authentication. This instruction authenticates the address in the general-purpose register that is specified by <Xn>, using a modifier and the specified key, and calls a subroutine at the authenticated address, setting register X30 to PC+4.
The modifier is:

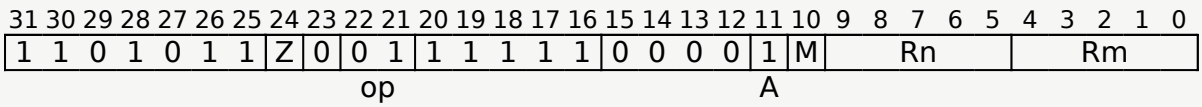
- In the general-purpose register or stack pointer that is specified by <Xm|SP> for BLRAA and BLRAB.
- The value zero, for BLRAAZ and BLRABZ.

Key A is used for BLRAA and BLRAAZ. Key B is used for BLRAB and BLRABZ.

If the authentication passes, the PE continues execution at the target of the branch. For information on behavior if the authentication fails, see *Faulting on pointer authentication*.

The authenticated address is not written back to the general-purpose register.

Integer
(FEAT_PAuth)



Key A, zero modifier (Z == 0 && M == 0 && Rm == 11111)

```
BLRAAZ <Xn>
```

Key A, register modifier (Z == 1 && M == 0)

```
BLRAA <Xn>, <Xm|SP>
```

Key B, zero modifier (Z == 0 && M == 1 && Rm == 11111)

```
BLRABZ <Xn>
```

Key B, register modifier (Z == 1 && M == 1)

```
BLRAB <Xn>, <Xm|SP>
```

```
integer n = UInt(Rn);
integer m = UInt(Rm);
boolean use_key_a = (M == '0');
boolean source_is_sp = ((Z == '1') && (m == 31));
```

```
if !IsFeatureImplemented(FEAT_PAuth) then
    UNDEFINED;

if Z == '0' && m != 31 then
    UNDEFINED;
```

Assembler Symbols

<Xn>	Is the 64-bit name of the general-purpose register holding the address to be branched to, encoded in the "Rn" field.
<Xm|SP>	Is the 64-bit name of the general-purpose source register or stack pointer holding the modifier, encoded in the "Rm" field.

Operation

```
bits(64) target = X[n, 64];

bits(64) modifier = if source_is_sp then SP[] else X[m, 64];

if use_key_a then
    target = AuthIA(target, modifier, TRUE);
else
    target = AuthIB(target, modifier, TRUE);

if IsFeatureImplemented(FEAT_GCS) && GCSPCREnabled(PSTATE.EL) then
    AddGCSRecord(PC64 + 4);
X[30, 64] = PC64 + 4;

// Value in BTypeNext will be used to set PSTATE.BTYPE
BTypeNext = '10';
BranchTo(target, BranchType_INDCALL, FALSE);
```

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