

Errata

Publication V

Table 5. in Appendix C incorrectly lists the backwards-compatibility of some Pointer Authentication instruction with pre-existing ARMv8-A processors. A corrected table has been included on page 120.

ARMv8-A PA Instructions

List of PA instructions. *PA Key* indicates the PA key the instruction uses. *Addr.* indicates the source of the address to be signed / authenticated (*Xd* indicates that the address is specified using a general purpose register). *Mod.* indicates the modifier used by the instruction (*Xm* indicates that the modifier is specified by a general purpose register.) The *backwards-compatible* column indicates if the instruction encoding resides in the NOP space for pre-existing ARMv8-A processors.

| Instruction | Mnemonic | Instr. | | PA Key Data | | Gen-eric | Addr. | Mod. | Backwards-compatible |
|---|-----------|--------|---|-------------|---|----------|-----------|-----------|----------------------|
| | | A | B | A | B | | | | |
| BASIC POINTER AUTHENTICATION INSTRUCTIONS | | | | | | | | | |
| Add PAC to instr. addr. | paciasp | ✓ | | | | | LR | SP | ✓ |
| | pacia | ✓ | | | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | paciaz | ✓ | | | | | LR | zero | ✓ |
| | paciza | ✓ | | | | | <i>Xd</i> | zero | ✗ |
| | pacial716 | ✓ | | | | | X17 | X16 | ✓ |
| | pacibsp | | ✓ | | | | LR | SP | ✓ |
| | pacib | | | ✓ | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | pacibz | | | ✓ | | | LR | zero | ✓ |
| | pacizb | | | ✓ | | | <i>Xd</i> | zero | ✗ |
| | pacib1716 | | ✓ | | | | X17 | X16 | ✓ |
| Add PAC to data addr. | pacda | | | ✓ | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | pacdza | | | ✓ | | | <i>Xd</i> | zero | ✗ |
| | pacdb | | | | ✓ | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | pacdzb | | | | ✓ | | <i>Xd</i> | zero | ✗ |
| Calculate generic MAC | pacga | | | | | ✓ | | | ✗ |
| Authenticate instr. addr. | autiasp | ✓ | | | | | LR | SP | ✓ |
| | autia | ✓ | | | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | autiaz | ✓ | | | | | LR | zero | ✓ |
| | autiza | ✓ | | | | | <i>Xd</i> | zero | ✗ |
| | autial716 | ✓ | | | | | X17 | X16 | ✓ |
| | autibsp | | ✓ | | | | LR | SP | ✓ |
| | autib | | | ✓ | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | autibz | | | ✓ | | | LR | zero | ✓ |
| | autizb | | | ✓ | | | <i>Xd</i> | zero | ✗ |
| | autib1716 | | ✓ | | | | X17 | X16 | ✓ |
| Authenticate data addr. | autda | | | ✓ | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | autdza | | | ✓ | | | <i>Xd</i> | zero | ✗ |
| | autdb | | | | ✓ | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | autdzb | | | | ✓ | | <i>Xd</i> | zero | ✗ |
| Strip PAC | xpacd | | | | | | <i>Xd</i> | | ✗ |
| | xpaci | | | | | | <i>Xd</i> | | ✗ |
| | xpac1ri | | | | | | LR | | ✓ |
| COMBINED POINTER AUTHENTICATION INSTRUCTIONS | | | | | | | | | |
| Authenticate instr. addr. and return | retaa | ✓ | | | | | LR | SP | ✗ |
| | retab | | ✓ | | | | LR | SP | ✗ |
| Authenticate instr. addr. and branch | braa | ✓ | | | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | braaz | ✓ | | | | | <i>Xd</i> | zero | ✗ |
| | brab | | | ✓ | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | brabz | | | ✓ | | | <i>Xd</i> | zero | ✗ |
| Authenticate instr. addr. and branch with link | blraa | ✓ | | | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | blraaz | ✓ | | | | | <i>Xd</i> | zero | ✗ |
| | blrab | | | ✓ | | | <i>Xd</i> | <i>Xm</i> | ✗ |
| | blrabz | | | ✓ | | | <i>Xd</i> | zero | ✗ |
| Authenticate instr. addr. and exception return | eretaa | ✓ | | | | | ELR | SP | ✗ |
| | eretab | | ✓ | | | | ELR | SP | ✗ |
| Authenticate data. addr. and load register | ldraa | | | | ✓ | | <i>Xd</i> | zero | ✗ |
| | ldrab | | | | | ✓ | <i>Xd</i> | zero | ✗ |