



Release Note for Morello Instruction Emulator

2.3-533

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Issue 533

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Release information

Document history

Issue	Date	Confidentiality	Change
2068-01	28 July 2022	Non-Confidential	2.0-68 release
2170-01	27 October 2022	Non-Confidential	2.1-70 release
2274-01	28 February 2023	Non-Confidential	2.2-74 release
2.3-533	23 July 2023	Non-Confidential	2.3-533 release

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1. Release Note for Morello Instruction Emulator 2.3-533

Version 2.3-533

Target platform

Linux AArch64

Date published

23 June 2023

MD5

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SHA-256

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Description

The Morello Instruction Emulator (Morello IE) is a tool for software developers and researchers who are interested in the Morello architecture. It allows running userspace Morello applications on AArch64 Linux systems in a non-Morello environment and provides a number of analysis and debugging tools. It can be used to help with porting software to Morello, to experiment with capabilities and Morello compartments as well as measure and analyse performance of Morello applications.

System requirements

System requirements are as follows:

- Arm v8.2 64-bit hardware (v8.0 supported with some limitations).
- Existing 64-bit userspace GNU/Linux environment (for example, Debian 10 or Ubuntu 18.04).
- The host system must have Glibc 2.28 or above.

Install

To install, run the downloaded installer in a Bash shell. Use `--help` option for the usage details. More information can be found in:

- <https://developer.arm.com/documentation/102270>
- <https://developer.arm.com/morello>
- <https://community.arm.com/support-forums/f/morello-forum>

Feedback

Feedback and questions can be sent to `morello-emulator-support (at) arm.com`.

Highlights

Highlights in this release:

- Support for Armv8.0 devices
- Better support for running apps based on Morello Glibc
- Debugger and tracer improvements

New functionality

New functionality in this release:

- Added LSE atomics emulation to allow running on devices that only provide Armv8.0 architecture features.
- Tracer can now save instruction and memory traces to a file.
- Tracer can be instructed to trace only specific thread.
- Tracer will trace the entire application by default (control of the scope of tracing works as before).
- New debugger commands: list stack frames and list memory reservations.
- Debugger can now print selected registers instead of showing all of them to help focus on what's important.
- Debugger can display the `PSTATE` and `CCTLR_EL0` registers.
- Capability permission encoding now uses `I` for `BRANCH_SEALED_PAIR` and `E` for `EXECUTIVE`.
- Rebased on the recent DynamoRIO version 9.93 for improvements in the instruction decoder.
- Default cache model parameters are now aligned with the Morello board configuration.

Fixed in this release

Fixed in this release:

- Fixed segmentation fault when running multi-threaded application based on Morello Glibc
- Fixed use of DDC for checking memory accesses in A64 mode.
- Fixed not raising SIGBUS when LSB is set in the 64-bit branch target address in A64 mode.
- Fixed counting load / store register and load / store pair instructions in tracer.