



Release Note for GNU Arm Embedded Toolchain

10.3-2021.10

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Release Note for GNU Arm Embedded Toolchain

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Release information

Document history

Issue	Date	Confidentiality	Change
10.3-2021.10	21 October 2021	Non-Confidential	10.3-2021.10 Release
10.3-2021.07	29 July 2021	Non-Confidential	10.3-2021.07 Release
10-2020-q4-major	11 December 2020	Non-Confidential	10-2020-q4-major Release
9-2020-q2-update	30 June 2020	Non-Confidential	9-2020-q2-update Release
10-2020-q2-preview	29 June 2020	Non-Confidential	10-2020-q2-preview Release
9-2019-q4-major	6 November 2019	Non-Confidential	9-2019-q4-major Release
8-2019-q3-update	10 July 2019	Non-Confidential	8-2019-q3-update Release
8-2018-q4-major	20 December 2018	Non-Confidential	8-2018-q4-major Release
7-2018-q2-update	27 June 2018	Non-Confidential	7-2018-q2-update Release
7-2017-q4-major	18 December 2017	Non-Confidential	7-2017-q4-major Release
6-2017-q2-update	28 June 2017	Non-Confidential	6-2017-q2-update Release
6-2017-q1-update	23 February 2017	Non-Confidential	6-2017-q1-update Release
6-2016-q4-major	21 December 2016	Non-Confidential	6-2016-q4-major Release
5-2016-q3-update	28 September 2016	Non-Confidential	5-2016-q3-update Release
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1. Release Note for GNU Arm Embedded Toolchain 10.3-2021.10

GNU Arm Embedded Toolchain 10.3-2021.10

This release includes bare metal pre-built binaries for AArch32 EABI targets, which can be hosted on:

- Windows 10 or later on IA-32 or x86_64
- Mac OS X 10.14 or later on x86_64
- Linux on x86_64

These toolchains are built on and for Ubuntu 16.04 on x86_64, and will likely also be useable on OS versions:

- later than Ubuntu 16.04
- RHEL 8
- Linux on AArch64

These toolchains are built on and for Ubuntu 18.04 on AArch64, and will likely also be useable on OS versions:

- later than Ubuntu 18.04
- RHEL 8

For Windows, the binaries are provided with an installer and as a zip file.

For Linux, the binaries are provided as tarball files.

For Mac OS X, the binaries are provided as tarball and pkg files.

The release also contains source code package (together with build scripts and instructions to setup the build environment), which is composed of:

- gcc : refs/vendors/ARM/heads/arm-10 git://gcc.gnu.org/git/gcc.git commit a7eb0564c3060418b5ca68c2806ad74f73384fd0
- binutils : binutils-2_36-branch git://sourceware.org/git/binutils-gdb.git commit a7eb3ff36cebc093af6658049e03d63579dade86
- newlib and newlib-nano : 2a3a03972b35377aef8d3d52d873ac3b8fcc512c git://sourceware.org/git/newlib-cygwin.git commit 2a3a03972b35377aef8d3d52d873ac3b8fcc512c
- gdb : gdb-10-branch git://sourceware.org/git/binutils-gdb.git commit abbf09189720ddc14fe71d0afdfa7653b8c67b5d

Note that some or all of the following prerequisites are downloaded when building from source:

- EnvVarUpdate NSIS script : <http://nsis.sourceforge.net/mediawiki/images/a/ad/EnvVarUpdate.7z>
- expat 2.1.1 : <https://downloads.sourceforge.net/project/expat/expat/2.1.1/expat-2.1.1.tar.bz2>
- gmp 6.1.0 : <https://gmplib.org/download/gmp/gmp-6.1.0.tar.bz2>
- isl 0.18 : <https://sourceforge.net/projects/libisl/files>
- libelf 0.8.13 : <https://fossies.org/linux/misc/old/libelf-0.8.13.tar.gz>
- libiconv 1.15 : <https://ftp.gnu.org/pub/gnu/libiconv/libiconv-1.15.tar.gz>
- mpc 1.0.3 : <ftp://ftp.gnu.org/gnu/mpc/mpc-1.0.3.tar.gz>
- mpfr 3.1.4 : <http://www.mpfr.org/mpfr-3.1.4/mpfr-3.1.4.tar.bz2>
- python 2.7.7 : <https://www.python.org/ftp/python/2.7.7/python-2.7.7.msi>
- zlib 1.2.8 : <http://www.zlib.net/fossils/zlib-1.2.8.tar.gz>

Features:

- All GCC 10.3 features

Tests:

- Targets:
 - Variety of Cortex-M0/M0+/M3/M4/M7/A9 boards
 - Qemu
 - Arm Fast Models

Notable changes in 10.3-2021.10 release:

- Added mitigation for the VLLDM instruction security vulnerability described in: <https://developer.arm.com/support/arm-security-updates/vlldm-instruction-security-vulnerability>

Known issues:

- Doing IPA on CMSE generates a linker error:

The linker will error out when resulting object file contains a symbol for the clone function with the __acle_se prefix that has a non-local binding.

Issue occurs when compiling binaries for M-profile Secure Extensions where the compiler may decide to clone a function with the cmse_nonsecure_entry attribute.

Although cloning nonsecure entry functions is legal, as long as the clone is only used inside the secure application, the clone function itself should not be seen as a secure entry point and so it should not have the __acle_se prefix.

A possible workaround for this is to add a 'noclone' attribute to functions with the 'cmse_nonsecure_entry'. This will prevent GCC from cloning such functions.

- GCC can hang or crash if the input source code uses MVE Intrinsics polymorphic variants in a nested form. The depth of nesting that triggers this issue might vary depending on the host machine. This behaviour is observed when nesting 7 times or more on a high-end workstation.

On less powerful machines, this behaviour might be observed with fewer levels of nesting. This issue is reported in https://gcc.gnu.org/bugzilla/show_bug.cgi?id=91937