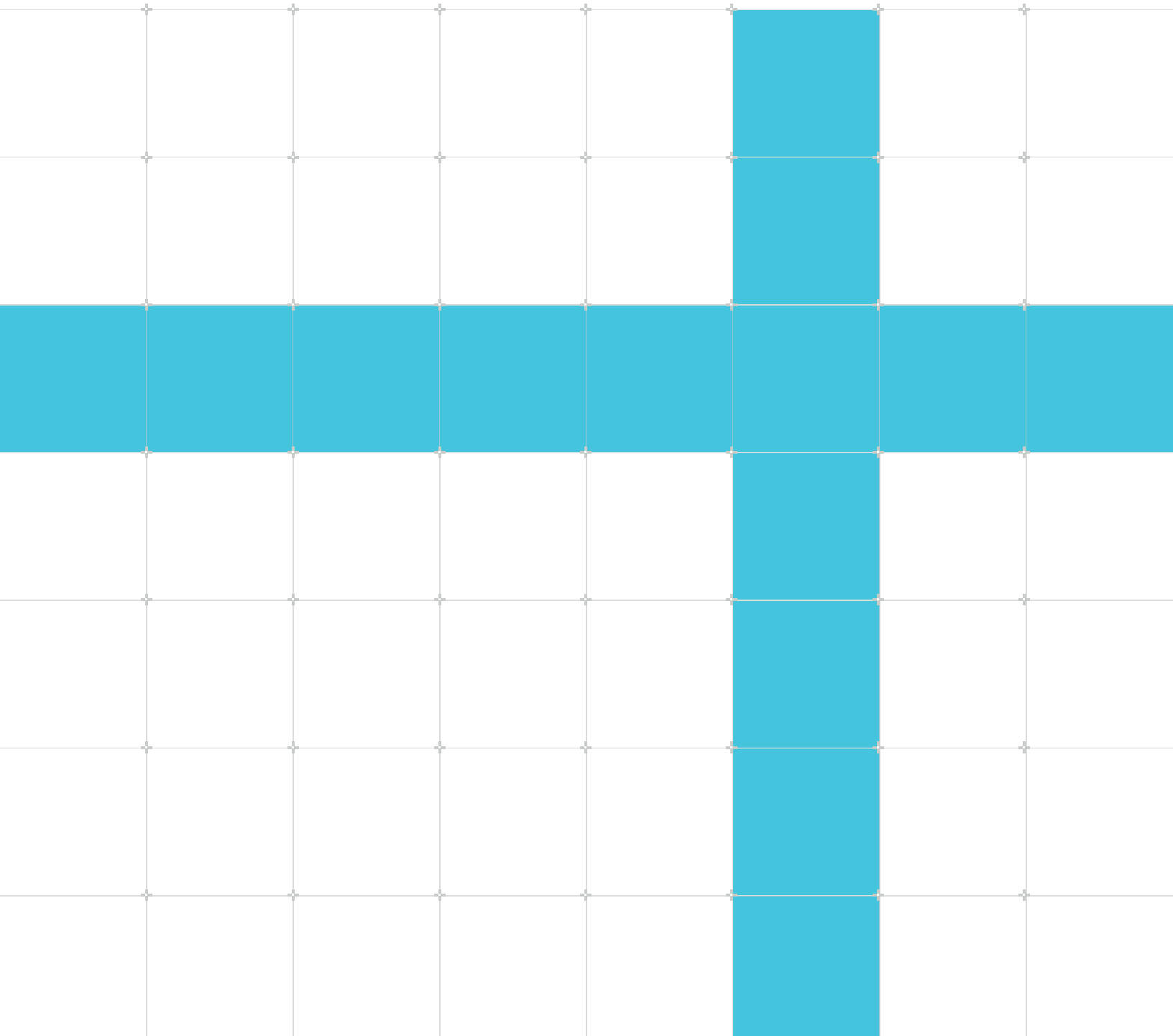
# Release Note for Arm GNU-A Toolchain

9.2-2019.12



**Issue 01**
109388_9.2-2019.12_01_en



# Release Note for Arm GNU-A Toolchain



## Release information

### Document history

| Issue | Date | Confidentiality | Change |
|---|---|---|---|
| 9.2_2019.12-01 | 19 December 2019 | Non-Confidential | 9.2-2019.12 release |
| 8.3_2019.03-01 | 29 March 2019 | Non-Confidential | 8.3-2019.03 release |
| 8.3_2019.02-01 | 4 March 2019 | Non-Confidential | 8.3-2019.02 release |
| 8.2_2019.01-01 | 15 January 2019 | Non-Confidential | 8.2-2019.01 release |
| 8.2_2018.11-01 | 23 November 2018 | Non-Confidential | 8.2-2018.11 release |
| 8.2_2018.08-01 | 31 August 2018 | Non-Confidential | 8.2-2018.08 release |

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# Contents

# 1. Release Note for Arm GNU-A Toolchain 9.2-2019.12

Version 9.2-2019.12. Released December 19, 2019.

## Description

GNU 9.2 cross-toolchain for the A-profile processors

## Features

This release includes the following features:

- Based on GCC 9.2 (See https://gcc.gnu.org/gcc-9/changes.html for details).
- Supported targets on Windows(x86_64): AArch64 (bare-metal and Linux), AArch32 (bare-metal, Linux hard-float)
- Supported targets on Linux(x86_64): AArch64 (bare-metal, Linux, Linux big-endian), AArch32 (bare-metal, Linux hard-float)
- Supported targets on Linux(AArch64): AArch64 (bare-metal), AArch32 (bare-metal, Linux hard-float)

## Changes since Arm release GCC 8.3-2019.03

This release contains the following changes since Arm release GCC 8.3-2019.03:

- Additional AArch64 hosted cross toolchains for AArch64 (bare-metal) and AArch32 (bare-metal, Linux hard-float)
- Additional Windows hosted cross toolchains for AArch64 (Linux) and AArch32 (Linux hard-float)
- Retired Linux(x86_64) toolchain for AArch64 (big-endian bare-metal) and AArch32 (Linux soft-float)
- Changed toolchain naming convention to match standard target triplet naming convention, with vendor name being none. For example, arm-eabi is arm-none-eabi.
- Fixed the Windows toolchain convention to correctly include mingw-w64 instead of mingw32

## Content

This release includes the following items:

| Component | Description |
|---|---|
| GCC 9.2 | Repository: svn://gcc.gnu.org/svn/gcc/branches/ARM/arm-9-branch<br><br>Revision: 277439<br>Sources provided in release source tar ball. |

| Component | Description |
|---|---|
| glibc 2.30 | Repository: git://sourceware.org/git/glibc.git<br><br>Revision: 50f20fe506abb8853641006a7b90a81af21d7b91<br><br>Release note |
| binutils 2.33.1 | Repository: git://sourceware.org/git/binutils-gdb.git<br><br>Revision: da3b036b57c0d409fc1fc3e25597fa13dc71baf5<br><br>Release note |
| GDB 8.3.0 | Repository: git://sourceware.org/git/binutils-gdb.git<br><br>Revision: e908e11a4f74ab6a06aef8c302a03b2a0dbc4d83<br><br>GDB-with-python support for Python 2.7.6 (x86_64 builds).<br><br>GDB-with-python support for Python 2.7.13 (i686-mingw32 builds).<br><br>Release note |
| libexpat 2.2.5 | Repository: https://github.com/libexpat/libexpat.git<br><br>Revision:<br><br>Release note |
| Linux Kernel | Repository: git://git.kernel.org/pub/scm/linux/kernel/git/stable/linux-stable.git<br><br>Revision: v4.20.13<br><br>Release note |
| libgmp 4.3.2<br><br>libisl 0.15<br><br>libmpfr 3.1.6<br><br>libmpc 1.0.3<br>libiconv 1.15 | Sources provided in release source tar ball. |

## Host requirements

The host requirements are as follows:

| Description | Requirement | OS identifier in the toolchain triplet |
|---|---|---|
| Windows on 64-bit x86 (x86_64) | Windows 10 | mingw-w64-i686 |
| Linux on 64-bit x86(x86_64) | Ubuntu 16.04 LTS or later RHEL 7 or later | x86_64 |
| Linux on 64-bit Arm(AArch64) | Ubuntu 18.04 LTS or later RHEL 8 or later | aarch64 |

## Known dependencies

Known dependencies are as follows:

- GDB's Python support requires Python compiled with UCS-4 support (built with –enable-unicode=ucs4) for Linux (x86_64) and Windows hosts
- GDB's Python support requires Python DLL dependencies for Windows host.
- Toolchains dedicated for Windows host require mingw-w64 library, a complete runtime environment for GCC.

## The GNU Toolchains

The GNU toolchains are as follows:

| Name | Host | Target |
|---|---|---|
| aarch64-aarch64-none-elf | AArch64 Linux | AArch64 ELF bare-metal target. |
| aarch64-arm-none-eabi | AArch64 Linux | AArch32 bare-metal target. |
| aarch64-arm-none-linux-gnueabihf | AArch64 Linux | AArch32 target with hard float. |
| mingw-w64-i686-arm-none-eabi | Windows | AArch32 bare-metal target. |
| mingw-w64-i686-aarch64-none-elf | Windows | AArch64 ELF bare-metal target. |
| mingw-w64-i686-arm-none-linux-gnueabihf | Windows | AArch32 target with hard float. |
| mingw-w64-i686-aarch64-none-linux-gnu | Windows | AArch64 GNU/Linux target. |
| x86_64-aarch64-none-elf | x86_64 Linux | AArch64 ELF bare-metal target. |
| x86_64-aarch64-none-linux-gnu | x86_64 Linux | AArch64 GNU/Linux target. |
| x86_64-aarch64_be-none-linux-gnu | x86_64 Linux | AArch64 GNU/Linux big-endian target. |
| x86_64-arm-none-eabi | x86_64 Linux | AArch32 bare-metal target. |
| x86_64-arm-none-linux-gnueabihf | x86_64 Linux | AArch32 target with hard float. |

## Released files

This release contains the following files:

| | |
|---|---|
| gcc-arm-*.tar.xz | Toolchain binaries |
| gcc-arm-src-snapshot-*.tar.xz | Toolchain sources |
| gcc-arm-src-snapshot-*-manifest.txt | Text manifest file with list of remote repositories for toolchain |
| gcc-arm-*-abe-manifest.txt | Input files for Linaro ABE build system. |
| *.asc | MD5 checksum files for sources and binaries |

## Installation instructions

Extract XZ compressed release archive using TAR archiving utility:

```
$ tar -xJf <toolchain binary> -C <destination directory>
```

```
Example for Linux(x86_64) hosted for AArch64 Linux target
$ tar -xJf gcc-arm-9.2-2019.12-x86_64-aarch64-linux-gnu.tar.xz -C /path/to/
destination/directory
```

Compute and check MD5 checksum of XZ compressed release archives using md5sum utility:

```
$ md5sum --check gcc-arm-9.2-2019.12-x86_64-aarch64-linux-gnu.tar.xz.asc gcc-
arm-9.2-2019.12-x86_64-aarch64-linux-gnu.tar.xz: OK
```

The prebuilt binary bundles can be un-tarred and executed in place. Assuming a RHEL6 host. Unpack the Linux cross toolchain:

```
$ mkdir install-lnx
$ tar x -C install-lnx -f <filename>.tar.xz
$ PATH=`pwd`/install-lnx/aarch64/bin:$PATH
```

## How to build the toolchain from sources

You can build GNU cross-toolchain for the A-profile from sources using Linaro ABE (Advanced Build Environment) and provided ABE manifest files.

Below example shows how to build gcc-arm-aarch64-linux-gnu toolchain from sources using Linaro ABE build system.

## Instructions

Clone ABE one of the URL below and checkout the stable branch (see Getting ABE):

```
$ git clone https://git.linaro.org/toolchain/abe.git
```

Create the build directory and change to it. Any name for the directory will work (see Building Toolchains With ABE):

```
$ mkdir build && cd build
```

Configure ABE (from the build directory):

```
$ ../abe/configure
```

And finally build toolchain (from the build directory):

```
$ ../abe/abe.sh --manifest gcc-arm-aarch64-linux-gnu-abe-manifest.txt --build all
```

## Known issues

This release has the following known issues:

- None.

## Ask questions

For any questions, please use the Arm Communities forums.

## Report bugs

Please report any bugs via the Linaro Bugzilla.