

Release Notes: GNUARM-NONE-EABI v15.01

30th September 2015

KPIT Technologies Limited is pleased to release the GNUARM-NONE-EABI v15.01, a cross compiler toolchain for ARM based Renesas RZ micro-controllers.

The GNUARM-RZ toolchain has been superseded by GNUARM-NONE-EABI toolchain. The functionality is same as that of GNUARM-RZ, this is done to maintain the universal naming convention for ARM toolchains.

SALIENT FEATURES

1. The GNUARM-NONE-EABI v15.01 toolchain is based on,

GCC 4.9.3 [snapshot dated 29th May 2015],

Binutils 2.24 [snapshot dated 4th June 2015],

Newlib 2.2.0 [released],

GDB 7.8.2 [released].

2. The GNUARM-NONE-EABI v15.01 toolchain provides multi-lib for Cortex-A/R/M targets.

Please refer to the following link for the correct command line options to be passed to GCC/G++ for the Cortex-A/R/M architecture variants,

<http://www.kpitgnutools.com/phpmyfaq/index.php?aktion=artikel&rubrik=013001&id=553&lang=en>

3. This toolchain has been tested for Cortex-A9 target only.
(**Note:** Toolchain has been tested only for 'little' endian mode.)

ABOUT GNUARM-NONE-EABI v15.01

Release Version:	GNUARM-NONE-EABI v15.01
Release Date:	30 th September 2015
Platforms Supported:	Red Hat GNU/Linux v8.0 or later (or compatible distribution) Windows XP, Windows 7 (32-bit and 64-bit), Windows 8, Windows 10.
Language:	C, C99, C++
Targets:	Cortex-A9, Cortex-R4 and Cortex-M3
Object File Format:	ELF

CHANGES IN THE GNUARM-NONE-EABI v15.01 RELEASE

This section describes the enhancements made and the issues fixed in the v15.01 release.

GCC:

1. The GNUARM-NONE v14.02 toolchain sets an incorrect address while accessing a register field via struct/union.

This issue has been fixed.

2. The linker generated following error message on enabling garbage collection of unused input sections (--gc-sections) when using custom linker script,

```
arm-none-eabi-ld: BFD (GNU Binutils) 2.24 assertion fail ../elf-v14.02-src-
none//binutils-2.24/bfd/elf32-arm.c:12387.
```

This issue has been fixed.

3. The GNUARM-NONE Windows toolchain generated an error "cc1.exe: error: no iconv implementation, cannot convert from UTF-8 to MS932" when the options '-fexec-charset=MS932' is used.

This issue has been fixed.

LIBRARIES:

1. The GNUARM-NONE optimized library is enhanced by adding more functions such as ldexpf(), frexpf() and exp10f().
2. The project build library with Newlib source is enhanced by adding the library functions nexttoward() and nexttowardf().

3. The project-built Newlib libraries failed to link with certain applications and generated the following errors,

```
./libout.a(syscalls.o): In function `_read':
syscalls.c:(.text+0x3c4): multiple definition of `_read'
./libout.a(linux-syscalls0.o):(.text+0x118): first defined here
./libout.a(syscalls.o): In function `_lseek':
syscalls.c:(.text+0x638): multiple definition of `_lseek'
```

This issue has been fixed.

4. The library generator (libgen) generated warnings while building the library with Newlib source. These warnings were displayed on the console while building a project in e2studio or on the command line.

```
./newlib/include/sys/syslimits.h:40:0: warning: "ARG_MAX" redefined [enabled by
default]
./newlib/include/sys/syslimits.h:52:0: warning: "PATH_MAX" redefined [enabled by
default]
./newlib/include/_ansi.h:69:42: note: in definition of macro '_DEFUN'
```

This issue has been fixed.

INSTALLER:

1. The link to GNUARM ABI (Application Binary Interface) is made available on <http://www.kpitgnutools.com> website and also provided along with Linux RPM and Windows installer.
2. The GNUARM toolchain windows installer contained incorrect files for the 'fpu' and 'interwork' multilibs.

This issue has been fixed in the windows installer.

KNOWN LIMITATIONS IN GNUARM-NONE-EABI

This section describes the known limitations in this release. We intend to fix these issues in our future releases. We occasionally release maintenance packs for critical bug fixes.

Windows and GNU/Linux:

1. Assembler does not support ARM architectures 'armv5e' and 'ep9312'.
2. For following CPUs, compiler generates an instruction 'bx lr'.
arm2, arm250, arm3, arm6, arm60, arm600, arm610, arm620, arm7, arm70, arm700, arm700i, arm710, arm7100, arm710c, arm720, arm7500, arm7500fe, arm7d, arm7di, arm7dm, arm7dmi, arm7m.
Assembler does not support this instruction for these CPUs, resulting in application build failure with assembler errors.
Similar problem has been observed with the following architectures as well:
armv2, armv2a, armv3, armv3m.

NEWLIB:

1. The 'C' library functions, 'strcat' and 'strncat' do not generate correct results with GDB simulator.

GDB:

1. For 'big endian' targets debugger fails to start the debugging process.
2. For 'thumb' mode:
 - a. Debugger shows incorrect values for local and global variables.
 - b. While stepping over the multiplication operation, debugging process goes in an infinite loop.
 - c. While debugging floating point operations, execution halts with an error message:

```
Unhandled v6 thumb insn: 4603
0x00000004 in ?? ()
```

3. On using float-abi 'hard':
 - a. Debugging process halts with an error message:
0x00000004 in ?? ()
Cannot find bounds of current function

GDB-SIMULATOR:

1. The run simulator fails to simulate the 'mul' instruction correctly when destination register is identical to the first operand.

LIBGEN:

1. While building the Newlib library using 'libgen' tool, many compiler warnings are generated by the 'libgen' tool. These warnings are displayed on 'stdout' while building the runtime libraries. These warnings are observed while building the pre-built libraries as well.

TOOLS INFORMATION

1. The optimized libraries provided along with the newlib libraries in the toolchain do not require a separate download.
2. The optimized libraries ('liboptm.a' and 'liboptc.a') are not provided under GNU GPL. The source code of these optimized libraries is neither released nor available on request.
3. The "libgen" utility is not provided under GNU GPL. The source code of the "libgen" utility is neither released nor available on request.

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For your feedback and suggestions, please visit: <http://www.kpitgnutools.com/feedback.php>