

**Release Notes: GCC 4.9.2.201604-GNURL78**

22<sup>nd</sup> of December, 2016

CyberThor Studios Ltd. is releasing the GCC 4.9.2.201604-GNURL78, a cross compiler tool for Renesas RX micro-controllers.

**SALIENT FEATURES**

The GCC 4.9.2.201604-GNURL78 toolchain is based on:

- ❖ GCC 4.9.2 [released]
- ❖ Binutils 2.24 [released]
- ❖ Newlib 2.1.0 [released]
- ❖ GDB 7.8.2 [released]

The latest patches are applied to GCC, Binutils and Newlib sources.

**ABOUT GCC 4.9.2.201604-GNURL78**

Release Version:	GCC 4.9.2.201604-GNURL78
Release Date:	22 <sup>nd</sup> of December, 2016
Platforms Supported:	Red Hat GNU/Linux v8.0 or later (or compatible distribution) Windows XP, Windows 7, Windows 8, Windows 10
Language:	C, C99, C++
Targets:	G1X, I1X, D1X, LIN MCP, F1X, and L1X
Object File Format:	ELF



## CHANGES IN GCC 4.9.2.201604-GNURL78

This section describes the fixes made in the GCC 4.9.2.201604-GNURL78 release.

### **GCC/Binutils:**

1. [Improvement] In this release we are using new, significantly optimized libraries.
2. [Bug-Fix] LTO algorithm removes HardwareVectors in some cases, even though KEEP is used in the linker script. This issue has been fixed.
3. [Improvement] We added multiple new RTL patterns (in the RTL/code generator part of the compiler) aimed to reduce the code size and/or improve the speed of the RL78 executables. These include bitfield manipulation, builtin memory/string operation, bit rotations and integer multiplications.
4. [Bug-Fix] The "usum\_wideqih3" pattern caused compiler errors when using -Os. This issue has been fixed.
5. [Improvement] Replaced the 'skz/br' pair with 'bnz', when possible, to reduce the code size. This way saving up 4 bytes for each replaced pair.

### **INSTALLER and RPM:**

1. The GCC 4.9.2.201604-GNURL78 Installer onwards supports the 'Custom Installation' and 'Default Installation' modes. The 'Default Installation' mode is set by default where the tools are installed into the default location at "C:\Program Files\GCC 4.9.2.201604-GNURL78" and the user's username and activation key are silently accepted if cached in the registry.
2. The GNURL78 ABI (Application Binary Interface) is made available on our GNU Tools support website (<https://gcc-renesas.com>) and also provided along with Linux RPM and Windows installer.

### **Notes:**

This installer does not provide an option to integrate the GNURL78 toolchain with e2 studio, as the e2 studio IDE will automatically detect the GNURL78 toolchain installation on start-up for integration. Alternatively, you may use the 'Toolchain Management' feature in e2 studio to achieve this.

For details on e2 studio please visit the following link below:

[http://www.renesas.com/products/tools/ide/ide\\_e2studio/index.jsp](http://www.renesas.com/products/tools/ide/ide_e2studio/index.jsp)

There is no support in this installer to integrate toolchain with the HEW IDE.



This section describes the known issues in the GCC 4.9.2.201604-GNURL78 release.

**1. Following is a list of options and their combinations which can cause the Linker to fail:**

- a) -the-fsignaling-nans (with -fno-inline -fno-trapping-math)
- b) -fno-tree-pre option (with -O2)
- c) -fno-tree-forwprop (with -O1)
- d) -fno-tree-dominator-opts (with -O2 -ffast-math)
- e) -fno-strict-aliasing option
- f) -fno-signed-zeros
- g) -fno-inline (with -fno-cse-follow-jumps)

All these options need addition of the -DSTACK\_SIZE=4096 flag.

**Other known problems that may occur:**

- a) Unrecognized insn when using the -fno-tree-fre option
- b) Impossible constraint error using the -fno-tree-dominator-opts option whe used with -fno-tree-dominator-opts flag.
- c) Internal compiler error when using the following two flags:
  - # -fno-tree-copyrename
  - #-fno-rerun-cse-after-loop



## FREE SUPPORT FOR GCC 4.9.2.201604-GNURL78

For free technical support, please register at  
<https://gcc-renesas.com>

For your feedback and suggestions, please visit  
<https://gcc-renesas.com/help/contact-us/>

