

**Release Notes: GNURX v14.01**

23<sup>rd</sup> January 2014

KPIT Technologies Limited is releasing the GNURX v14.01, a cross compiler tool for Renesas RX micro-controllers.

**SALIENT FEATURES**

1. The GNURX v14.01 toolchain is based on  
GCC 4.7.3 [released],  
Binutils 2.23.1 [released],  
Newlib 2.0.0 [released] and  
GDB 7.5 [released].
2. The latest patches are applied to gcc, binutils and newlib sources.
3. The GNURX v14.01 toolchain adds support for the RXv2 architecture, which is the enhanced version of RX.
4. The GNURX toolchain comes with more code size optimization.
5. The GNURX v14.01 toolchain adds a new compiler option '-morder1' which gives better optimization results. This option affects the register allocation order.

**ABOUT GNURX v14.01**

Release Version:	GNURX v14.01
Release Date:	23 <sup>rd</sup> January 2014
Platforms Supported:	Red Hat GNU/Linux v8.0 or later (or compatible distribution) Windows XP, Windows 7 (32-bit and 64-bit)
Language:	C, C99, C++
Targets:	RX100 RX200 RX600
Object File Format:	ELF

**CHANGES IN THE GNURX-ELF v14.01 RELEASE**

This section describes the enhancements made and the issues fixed in the v14.01 release.

**GCC:**

1. GNURX toolchain generated "Internal compiler error" in certain test cases with optimization options.  
This issue has been fixed.
2. GNURX toolchain gives compiler error when the built-in function '`__builtin_rx_wait(void)`' is used in C++ projects.  
This issue has been fixed.
3. GNURX toolchain generated "Unsigned char sign extension" when `-O0` and `-O1` optimizations are used.  
This issue has been fixed.
4. The GNURX toolchain generated linker errors while building code which uses memory beyond 8 MB relative to current PC location. This issue is caused by the generation of the 'bsr' instruction which performs relative 24-bit branches. The v14.01 version of the toolchain adds support for the compiler options, '`-mjsr`'. This option ensures that the toolchain generates the 'jsr' instruction which uses the 32-bit address.

**GDB:**

1. In "e2 studio" project, the debugger did not allow to edit the PC register hex value.  
This issue has been fixed.
2. The structure variable value is not visible in e2 studio expression view window under certain test scenarios.  
This issue has been fixed.
3. The RM (Floating-Point Rounding-Mode) value of the FPSW register and IPL (Processor Interrupt Priority Level) value of the PSW register is incorrect.  
This issue has been fixed.
4. When the function parameter is a register variable, value of the variable is incorrect in the first line at the main function.  
This issue has been fixed.
5. The GNURX toolchain causes debugging to be unreliable with the '`-mrelax`' option.  
This issue has been fixed.

**Libraries:**

1. While building optlib libraries using libgen tool, the user can get more optimized code for stdio functions by passing the following macro under compiler options, "-DOPTLIB\_NO\_FLOAT\_SUPPORT".

**INSTALLER and RPM:**

1. The GNURX v11.01 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 and the user's username and activation key are silently accepted if cached in the registry.
2. The GNURX ABI (Application Binary Interface) is made available on [www.kpitgnutools.com](http://www.kpitgnutools.com) website and also provided along with Linux RPM and Windows installer.
3. The GNURX v14.01 Installer will install the toolchain at the default location at "C:\Program Files\KPIT" in the "Default Installation" mode. The "Custom Installation" mode will prompt user to integrate the toolchain with HEW.

The GNURX v14.01 Installer does not provide an option to integrate with e2 studio, as the e2 studio IDE will automatically detect the GNURX v14.01 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 refer following link,

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

**KNOWN LIMITATIONS IN RX-ELF**

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. Some of the debug information is not generated for the projects built using the "-flto" optimization option and therefore source address is not visible while debugging in HEW.
2. Library Generator: Please visit the following link for the known issues and limitations related to this utility:  
<http://www.kpitgnutools.com/phpmyfaq/index.php?aktion=artikel&rubrik=010002&id=485&lang=en>

**HEW (For Windows OS only):**

1. The 'Generate Makefile' feature is currently not supported in HEW.
2. For other limitations pertaining to the single interface for the compiler, assembler, linker and library generator, please visit the following link:

<http://www.kpitgntools.com/phpmyfaq/index.php?aktion=artikel&rubrik=003001&id=445&lang=en>

3. If the GNURX toolchain version v12.03 and above is installed in a directory with spaces, linking using '-flto' (Link Time Optimization) fails in HEW. This is due to limitation in GCC 4.7.2 and above versions. On command line, short path is used and hence, there is no problem in linking using '-flto'.

Please refer to the below FAQ for details and work-around,

<http://www.kpitgntools.com/phpmyfaq/index.php?aktion=artikel&rubrik=003001&id=523&lang=en>

4. On Windows 7, HEW crashes occasionally while upgrading the projects created using earlier versions of toolchains.  
To avoid this crash, please launch HEW in 'Windows XP' Compatibility mode. You can select it from, HEW executable or shortcut Properties -> Compatibility -> Compatibility mode -> Run this program in compatibility mode for -> 'Windows XP'

**Note:**

This is the last GNURX toolchain (v14.01) release with support to integrate with HEW. Subsequent GNURX toolchain releases will not support integration with "HEW" IDE.

**Windows and GNU/Linux:**

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.

For free technical support, please register at <http://www.kpitgntools.com>

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