

Release Notes: GNURX v13.01 MAINTENANCE PACK (MP1)

1st October 2013

KPIT Technologies Limited is releasing the GNURX v13.01 (MP1), a cross compiler tool for Renesas RX micro-controllers.

SALIENT FEATURES

1. The GNURX v13.01 (MP1) 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 assembler now supports the '-mcpu' option with the following valid target variants, rx600, rx200 and rx100. This allows the toolchain to generate warnings for any hardware floating point unit instructions passed to targets that do not support them.
4. The GNURX toolchain now supports generation of BSET, BCLR and BNOT instructions through the following built-in functions.
__builtin_rx_bset, __builtin_rx_bnot and __builtin_rx_bclr.

For example,

```
__builtin_rx_bset(int data, int bit);
```

ABOUT GNURX v13.01 (MP1)

Release Version:	GNURX v13.01 (MP1)
Release Date:	1 st October 2013
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 v13.01 MAINTENANCE PACK

This section describes the fixes made in the GNURX-ELF v13.01 maintenance pack 1 release.

1. The GNURX toolchain added new optimization where the "MOVU.B" and "CMP" instruction were combined to form the "AND" instruction. In certain cases, this caused the code to crash as the compiler rearranged the instruction sequence causing conditional branching to fail.

This issue has been fixed in this MP1 release.

CHANGES IN THE GNURX-ELF v13.01 RELEASE

This section describes the enhancements made and the issues fixed in the v13.01 release.

GCC:

1. The GNURX Windows toolchain generates internal compiler error for the given below test case,

```
// Testcase : test.cpp
typedef struct
{
    unsigned char data;
}Struct1;
typedef struct
{
    unsigned char rsv[0];
    Struct1 s1;
}Struct2;
Struct2 s2 = {{}, {100}};
```

This issue has been fixed.

2. The GNURX toolchain bit related instructions (BSET, BCLR and BNOT) were not working correctly in the RX simulator. It used to sometimes sets the value as 0xdeadbeff instead of the correct one. For example,

```
asm("mov.L #0xFE, R1");
asm("mov.L #0, R2");
asm("bset r2, R1"); // R1 = 0xdeadbeff after this
```

This issue has been fixed.

3. The GNURX toolchain generates garbage values for the instructions aligned at value 10 or greater (.align 10). This results in execution of an illegal instruction code.

This issue has been fixed.

4. The toolchain will now accept new value to the -mcpu option, namely rx100 along with rx200, rx600 and rx610. Toolchain will now create new built-in defines, __RX100__, __RX200__ and __RX600__ for respective target options.
5. The GNURX toolchain fails for malloc with project built newlib libraries resulting in unhandled software interrupt.

This issue has been fixed.

GDB:

1. The gdb-run simulator failed to set non-zero value to the ACC register.

This issue has been fixed.

2. The gdb-run simulator failed to simulate the SATR instruction resulting in a SIGILL error.

This issue has been fixed.

3. GDB failed to display the correct value of a complex or imaginary type variable.

This issue has been fixed.

4. GDB unwinding inside interrupt routine did not work as expected. The unwinding did not stop at the interrupt function and continued further.

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".
2. rx-elf-libgen utility only generated error if there was a problem in the vfscanf.c file and did not report any errors if present in other files. This has been fixed

This issue has been fixed

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 HEW (if found) 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 website and also provided along with Linux RPM and Windows installer.
3. The GNURX v13.01 toolchain will be automatically detected for registration on start-up of e2 studio (from v2.0 onwards). You may also use the Toolchain Management feature in e2 studio IDE to achieve this. For details on e2 studio please refer following link, 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 "-flt0" 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.kpitgntools.com/phpmyfaq/index.php?aktion=artikel&rubrik=010002&id=485&lang=en>
3. The GNURX toolchain causes debugging to be unreliable with the '-mrelax' option

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 '-flt0' (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 '-flt0'.

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'

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>