

Release Notes: GNURX v11.03

12th October 2011

KPIT Cummins Infossystems Limited is releasing the GNURX v11.03, a cross compiler tool for Renesas RX micro-controllers.

SALIENT FEATURES

1. The GNURX v11.03 toolchain is based on gcc-4.5.3 [released] binutils-2.21.51 [snapshot dated 13th January 2011], newlib-1.19.0 [released] and gdb-7.3.1 [released].
2. The latest patches are applied to gcc, binutils and newlib sources.
3. The GNURX toolchain v11.03 and v11.02 has the same CoreMark benchmark score of 2.34 on hardware.

ABOUT GNURX v11.03

Release Version:	GNURX v11.03
Release Date:	12 th October 2011
Platforms Supported:	Red Hat GNU/Linux v8.0 or later (or compatible distribution) Windows NT / 2000 / XP / Vista / Windows 7
Language:	C, C99, C++
Targets:	RX200 RX600
Object File Format:	ELF

CHANGES IN THE GNURX-ELF v11.03 RELEASE

This section describes the enhancements made and the issues fixed in the v11.02 release.

GCC:

1. The GNURX toolchain v11.03 and v11.02 has the same CoreMark benchmark score of 2.34 on hardware.
2. The GNURX toolchain generated internal compiler error for the following test case,

```
int main (void)
{
    __builtin_rx_setpsw(__builtin_rx_mvfc (0)&0x10);
    return 0;
}
```

This bug has now been fixed.

3. The GNU RX toolchain was not generating any warning or error messages when more than one interrupt handler is assigned an attribute as 'fast_interrupt'. This bug has now been fixed.
4. The 'rx-elf-gdb' was not reporting the sections loaded in response to the "load" command with a simulator target. This bug has now been fixed.
5. The GNU RX toolchain was generating an internal compiler error for the following test case where the 'weak' attribute was used along with static qualifier,

```
static long RsReadPerformanceCounter(void)
{
    return 0;
}
long RsReadPerformanceCounter(void) __attribute__((weak));
```

This bug has now been fixed.

6. The GNU RX toolchain was generating an internal compiler error for the following test case that uses attribute 'naked',

```
static int bar;
void __attribute__((naked)) ISRFunction(void)
{
    int foo, result;
    result = subFunction(&foo, &bar);
}
```

This bug has now been fixed.

7. The GNU RX toolchain was not saving and restoring the R15 register when entering and exiting an Interrupt Service Routine. This error is specifically observed when '-O3' optimization was used along with the '-funroll-all-loops'. This bug has now been fixed.

8. The 'iodefine.h' header file used for GNURX v11.02 toolchain has incorrect padding for MSTPCRA register. This bug has now been fixed.
9. The 'beq LABEL' in assembly code can sometimes cause invalid instructions to be generated in object code.
This bug has now been fixed.
10. The GNU RX toolchain was unable to disassemble the instruction 'MAX R0,R0' and generated incorrect objdump for this instruction.

```
ffffc00bd: fc 13 00 max [???], [???
```

The opcode corresponds to the instruction 'MAX R0,R0'.

This bug has now been fixed.

11. The RX compiler was generating an internal compiler error for the following test case when the option '-mbig-endian-data' is passed to it.

```
typedef unsigned short      INT16U;

#define BSCAN_ERR_PRINT    20
#define XSV_MAX_FAIL_PINS  50
struct bscan
{
    INT16U    error_ct;
    INT16U    history_idx;
    INT16U    history[XSV_MAX_FAIL_PINS];
    INT16U    err_position[XSV_MAX_FAIL_PINS];
    INT16U    rec_val[XSV_MAX_FAIL_PINS];
};

struct bscan      bscan_s;

int main(void)
{
    // TODO: add application code here
    INT16U    errors;
    const char * err_msg[3] = {"stuck at 0","stuck at 1","unknown"};
    errors = (bscan_s.error_ct < BSCAN_ERR_PRINT) ? bscan_s.error_ct :
    BSCAN_ERR_PRINT;
    return (errors);
}
```

This bug has now 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.

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. The GNURX toolchain has an issue related to the '-fstrict-aliasing' compiler option which gets enabled for optimization level '-O2' and above. Please turn off this option using the '-fno-strict-aliasing' compiler option in case of any inconsistent behavior with this toolchain.
2. The GNU RX toolchain uses the 'scmpu' instruction while performing 'memcmp' when optimization is enabled. This instruction fails as it compares a string and exits when it finds a null termination '\0' in memory.
3. 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.
For other limitations pertaining to the single interface for the compiler, assembler, linker and library generator, please visit the following link:

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

NOTE:

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.

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