

**Release Notes: GNURX v15.01 SERVICE PACK**14<sup>th</sup> May 2015

KPIT Technologies Limited is releasing the GNURX v15.01 (SP1), a cross compiler tool for Renesas RX micro-controllers.

**SALIENT FEATURES**

1. The GNURX v15.01 (SP1) toolchain is based on
  - GCC 4.8.4 [released],
  - Binutils 2.24 [released],
  - Newlib 2.2.0 [released] and
  - GDB 7.8.2 [released].
2. The latest patches are applied to gcc, binutils and newlib sources.
3. The GNURX toolchain comes with fixes related to string manipulation instructions and regression bug fixes.

**ABOUT GNURX v15.01 (SP1)**

Release Version:	GNURX v15.01 (SP1)
Release Date:	14 <sup>th</sup> May 2015
Platforms Supported:	Red Hat GNU/Linux v8.0 or later (or compatible distribution) Windows XP, Windows 7, Windows 8
Language:	C, C99, C++
Targets:	RX100 RX200 RX600 RX64M
Object File Format:	ELF

## CHANGES IN THE GNURX-ELF v15.01 SERVICE PACK

This section describes the fixes made in the GNURX-ELF v15.01 service pack 1 release.

1. The GNURX toolchain gives unexpected result for "min" and "max" instructions when optimization level "-O1" or higher is passed for following test case,

Ex :

```
/test.c/
```

```
#include <stdio.h>
```

```
#include <stdint.h>
```

```
#define MAX(a,b) (((a) > (b)) ? (a) : (b))
```

```
void abc(size_t idx, uint16_t value) __attribute__((noinline));
```

```
void abc(size_t idx, uint16_t value)
```

```
{
```

```
    int16_t signed_value = (int16_t)value;
```

```
    signed_value = MAX(signed_value, 0);
```

```
    printf("value=%f\n", (float)signed_value/100.0);
```

```
}
```

```
uint16_t r[4] = {0xFF, 0xFF, 0x00, 0x01};
```

```
int main()
```

```
{
```

```
    uint16_t val;
```

```
    uint16_t x = r[1] << 8 | r[0];
```

```
    abc(4, x);
```

```
}
```

This behavior was observed only with signed 8bit and 16bit integer values.

This issue has been fixed.

## CHANGES IN THE GNURX-ELF v15.01 RELEASE

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

### GCC/Binutils:

1. The GNURX toolchain supports the following new command-line option:

'-mno-allow-string-insns' - This disables the generation of RMPA and the string-manipulation instructions such as SMOVF, SMOVB, SMOVU, SCMPU, SUNTIL, SWHILE, etc., and generates emulation routines.

The above option is added to overcome the limitation on placement of data for string-manipulation instructions (see RX Hardware manual chapter 12.5.6).

2. The GNURX toolchain supports a new linker option, '--warn-orphan'. This option tells the linker to generate a warning message whenever it has to place an orphan section into the output file. e.g., for the below test case, linker did not generate any warning for the 'RX\_DESC' section, even though it was not defined in the linker script,

```
int test_array[4]__attribute__((section("RX_DESC")))= {1,2,3,4};
int main (void)
{
    return 0;
}
```

**Libraries:**

1. The GNURX toolchain provides separate set of multi-libs in order to ensure that \*no\* library routine uses string manipulation instructions such as SMOVF, SMOVB, etc.
2. Newlib and Optlib sources for memcpy and memmove are updated to provide alternative versions when string manipulation instructions such as SMOVF, SMOVB, etc., are disallowed.
3. The GNURX toolchain was setting incorrect value for the macros 'LDBL\_MANT\_DIG' and 'LDBL\_MAX\_EXP' when optlib was used. i.e., the value of 24 and 128 was set respectively instead of 53 and 1024. This value should be updated in Optlib, based on the option, '-m64bit-doubles' or '-m32bit-doubles' as in case of Newlib libraries.

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 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 Installer will install the toolchain at the default location at "C:\Program Files\KPIT" in the "Default Installation" mode and "Custom Installation" mode.

**Note:**

From GNURX v14.01 onwards, the installer does not provide an option to integrate the GNURX toolchain with e2 studio, as the e2 studio IDE will automatically detect the GNURX 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)

From the GNURX v14.02 release onwards, there is no support to integrate toolchain with the HEW IDE.

**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. Library Generator: Please visit the following link for the known issues and limitations related to this utility:  
<http://www.kpitgertools.com/phpmyfaq/index.php?aktion=artikel&rubrik=010002&id=485&lang=en>
2. The optimized libraries provided along with the newlib libraries in the toolchain do not require a separate download.
3. 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.
4. 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.kpitgertools.com>

For your feedback and suggestions, please visit

<http://www.kpitgertools.com/feedback.php>