Release Notes: GNURX v16.01

31st March 2016

KPIT Technologies Limited is releasing the GNURX v16.01, a cross compiler tool for Renesas RX micro-controllers.

SALIENT FEATURES

1. The GNURX v16.01 toolchain is based on,

    GCC 4.8.4 [released],

    Binutils 2.24 [released],

    Newlib 2.2.0 [released],

    GDB 7.8.2 [released].

2. The latest patches are applied to gcc, binutils and newlib sources.

ABOUT GNURX v16.01

Release Version:	GNURX v16.01
Release Date:	31st March 2016
Platforms Supported:	Red Hat GNU/Linux v8.0 or later (or compatible distribution), Windows 7, Windows 8, Windows 10
Language:	C, C99, C++
Targets:	RX100 RX200 RX600 RX64M RX700
Object File Format:	ELF

CHANGES IN THE GNURX-ELF v16.01

This section describes the fixes made in the GNURX-ELF v16.01 release.

GCC / BINUTILS:

1. The GNURX toolchain generated incorrect opcode for the 'mov.b #0xff, [r0]' instruction.

   This issue has been fixed.

2. The GNURX toolchain generated an unexpected warning, "section .bss lma wraps from 0xffffe9dc to 0x9dc", even though the .bss section was marked as NOLOAD.

   This warning has been removed.

3. The GNURX linker 'rx-elf-ld' tool generated segmentation fault on using the '-relax' option along with the '-no-keep-memory' option.

   This issue has been fixed.

4. Some c++ test cases did not execute as expected on using the linker option '--gc-sections'. The sections '.init_array' and '.fini_array' were discarded resulting in execution failure.

   This issue has been fixed.

5. The GNURX assembler used default alignment value of 4 bytes while Renesas RX assembler uses 1 byte alignment. The GNURX assembler is now 1 byte aligned same as Renesas RX assembler.

6. The GNURX objdump utility displayed non existing instructions in disassembly view such as "never" or "always" against the opcodes such as '1110' or '1111' for the .byte directive.

   This issue has been fixed.

LIBRARIES:

1. The GNURX libgen utility is now enhanced to support dynamic building of libgcc library.
   For example, following command can be used to build optlib and libgcc dynamically during project build:
   ```
   $rx-elf-libgen  --select-lib=optlib,libgcc  --header-files=all  --compiler-
   options=-mcpu=rx610,-mlittle-endian-data,-m64bit-doubles     --assembler-
   options=--mlittle-endian-data -o "libProjectName.a"
   ```

   The compiler options mentioned above will also be passed while building libgcc.

   Two libraries will be generated in the current working directory i.e., the libProjectName.a and the libgcc.a.

   Similarly the newlib and libgcc libraries can also be built.

   Note that, some warnings are observed on the console while building libgcc dynamically, similar warnings are also observed while statically building libgcc as part of toolchain build process.

INSTALLER AND RPM:

1. The GNURX Installer supports the 'Default Installation' and 'Custom Installation' modes. The 'Default Installation' mode is set by default where the tools are installed at the default location, "C:\Program Files\KPIT" and the username and activation key are silently accepted if cached in the registry. The "Custom Installation" mode allows user to install toolchain at custom directory.

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.

Note:

In-order to integrate the toolchain with Renesas e2 studio, please use the Renesas toolchain management feature in e2 studio IDE ('Help' > Add Renesas Toolchains')

For details on e2 studio please refer following link,
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.kpitgnutools.com/phpmyfaq/index.php?aktion=artikel&rubrik=010002&id=485&lang=en

2. The GNURX 'objdump' utility generates identical instructions for different opcodes.
   The instruction ".byte 0x80, 0x00" is disassembled as 'mov.b r0, [r0]' instead of 'mov.b r0, 0[r0]'

3. The optimized libraries provided along with the newlib libraries in the toolchain do not require a separate download.

4. 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.

5. 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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