
RTA-OS RH850/WR

Release Note - Version 2.0.5 (25-05-2017)

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1 Introduction

RTA-OS is an AUTOSAR compliant Operating System and associated tooling. This document provides release information for the RTA-OS RH850/WR port plug-in that customizes the RTA-OS development tools for the Renesas RH850 with the WindRiver_Diab compiler. It supplements the more general information you can find in the *Release Note*.

1.1 Version Information

This is Version 2.0.5 of the RTA-OS RH850/WR plug-in.

1.2 Installation

The installation process is covered in detail in the *RH850WR Port Guide*.

2 **Open EHI Calls**

Open issues are referred to by their call number in the ETAS Helpdesk International (EHI) system.

No EHI calls are open.

3 **Change History**

3.1 Version 2.0.5

Additional Features

The following features have been added to this release:

- Fifth Full Release (single core only).
- Support for the v5.9.6.2 of the Wind River (Diab) compiler tools.

Modified Features

The following features have been modified in this release:

- The CPU interrupt vector entries for G3M chip variants have been tuned when the v5.9.6.2 compiler is used as this compiler uses the correct encoding of the 'jr' instruction.
- The compiler options used to build the libraries now include '-Xwhole-program-optim=0' so that whole program optimization (WPO) is not applied to the RTA-OS library code. The RTA-OS test suite applies WPO to the test application code.
- Tested on the G3K, G3KH and G3M single core chip variants using Diab compiler versions v5.9.4.2, v5.9.4.6, and v5.9.6.2.

Removed Features

No features have been removed from this release.

3.2 Version 2.0.4

Additional Features

The following features have been added to this release:

- Fourth Full Release (single core only).
- Support for the D1x and P1LC variants.
- Support for Trusted-with-Protection (not supported on all hardware variants as the MPU cannot restrict access for trusted code on some parts i.e. F1L/R1L).
- Checks are now made to determine possible conflicts between configured interrupts and any interrupts required by the OS.

Modified Features

The following features have been modified in this release:

- Updated to run with the RTA-OS tools release (v5.5.8) and tests.
- The code to support the 'Enable stack repositioning' target option has been updated. When dealing with Tasks, ISRs, untrusted functions and untrusted hooks both the repositioned and normal code no longer relies on values stored in the CPU general purpose registers to be preserved over the call to untrusted code.
- Updated to add fix for EHI issue 534607.
- Tested on the G3K, G3KH and G3M single core chip variants using Diab compiler versions 5.9.4.2 and 5.9.4.6.

Removed Features

No features have been removed from this release.

3.3 Version 2.0.3

Additional Features

The following features have been added to this release:

- Third Full Release (single core only).
- Support for the F1K and P1M variants.
- Add SYNCP instructions to the vector table interrupt entries for G3M cores to address a reported issue from Renesas (ID95 SYNCP Instruction Insertion to Terminating-type Exception Handler).

Modified Features

The following features have been modified in this release:

- Updated the RH850WR port guide to add details on the TRAP, FETRAP and SYSCALL support.
- Updated to add fix for EHI issue 495721
- Tested on the G3K, G3KH and G3M single core chip variants using Diab compiler versions 5.9.4.2 and 5.9.4.6.

Removed Features

No features have been removed from this release.

3.4 Version 2.0.2

Additional Features

The following features have been added to this release:

- Second Full Release (single core only).
- Support for the v5.9.4.6 of the Wind River (Diab) compiler tools.
- RTA-OS supports the Wind River (Diab) compiler v5.9.4.2 and v5.9.4.6. Wind River have indicated that these compilers can generate incorrect code in some circumstances (please see Wind River issue report TCDIAB-13458) - please refer to the limitation section for further details.

Modified Features

The following features have been modified in this release:

- Updates and fully tests ORTI support for iSYSTEM winIDEA.
- Tested on G3K and G3M single core chip variants using Diab compiler versions 5.9.4.2 and 5.9.4.6.

Removed Features

No features have been removed from this release.

3.5 Version 2.0.1

Additional Features

The following features have been added to this release:

- Preliminary Release (single core only).
- Support for iSYSTEM User Tracing
- Os_INTChannel_x macros
- Support for the E1L, E1M-S, P1M-C and P1H-C chip variants.
- Test in StartOS so that the FPU target option cannot be used on an E1x core without the FPU.

Modified Features

The following features have been modified in this release:

- Updated the default implementation of `Os_Cbk_GetAbortStack()` so that no stack is used in both single and multicore applications.
- The code to support the 'Enable stack repositioning' target option has been updated. The assembly language instructions generated now do not rely on values stored in the CPU general purpose registers to be preserved over the call to untrusted code.
- The code to support the 'Enable stack repositioning' target option has been updated to use the compiler `noreturn/noinline` attributes.
- The untrusted stack check tests are now fully implemented and tested. These make sure that no stack is used before the stack has been safely tested.
- The support for stack and execution time measurement has been updated to prevent a possible miscalculation when a higher priority Category 2 interrupt occurs during the calculations.
- The code in `Os_longjmp` updated to protect against ISRs when the `longjmp` buffer is on the stack (only affects ECC tasks when 'Enable stack repositioning' is selected).
- Details on the `Os_Cbk_GetAbortStack()` callback now added to the documentation.
- Rework the OS Size Information support code (`ddump` strings) in the generated interrupt vector table to simplify the module size calculations.
- Rework the OS API code when used in applications with untrusted
- Tested on G3K and G3M single core chip variants using Diab compiler version 5.9.4.2.

Removed Features

No features have been removed from this release.

3.6 Version 2.0.0

Additional Features

The following features have been added to this release:

- First Full Release (single core only) .

10 Change History

Modified Features

The following features have been modified in this release:

- Tested on G3K and G3M single core chip variants.
- Support for handling of FPU context now tested.

Removed Features

No features have been removed from this release.

3.7 Version 1.99.4

Additional Features

The following features have been added to this release:

- Fifth Early Access Release.
- Support for iSYSTEM winIDEA analyzer.
- Support for the F1M chip variants (not tested on hardware).

Modified Features

The following features have been modified in this release:

- Moved compiler to only support v5.9.4.2 of the Wind River (Diab) compiler tools.
- Updated the library compiler options (See the RTA-OS RH850WR Port Guide for details).
- The RTA-OS library now tested with applications built with whole program optimization.
- R1L interrupt vector labels are updated to match the latest documentation.
- Target option to set the EBASE/RBASE registers updated to remove the RBASE register configuration as this cannot be changed at runtime.
- If the PIE interrupt (0xA0) is unconfigured the generated vector table entry is now always routed to `Os_abort()` even when the default interrupt is selected.

Removed Features

No features have been removed from this release.

3.8 Version 1.99.3

Additional Features

The following features have been added to this release:

- Fourth Early Access Release.
- Support for the C1H and C1M chip variants (not tested on hardware).
- Target option to allow user selection of the SDA address offset (23-bit or 16-bit).
- Target option to allow the default interrupt to be run at a low IPL.
- Target option to always use `Os_Cbk_GetAbortStack()` to set up a safe area of memory to use as a stack when executing the ProtectionHook
- Target option to set the optimizer strategy to Speed or Size.

Modified Features

The following features have been modified in this release:

- The `Os_abort` trap handler used when calling the ProtectionHook has been modified to use less stack and not use stack before calling `Os_Cbk_GetAbortStack()` when applicable
- The compiler options now include `'-W:pas:.s -W:a:'` so that all assembler code is pre-processed making sure the comments do not cause warnings.

Removed Features

No features have been removed from this release.

3.9 Version 1.99.2

Additional Features

The following features have been added to this release:

- Third Early Access Release.
- Target option to support handling of FPU context.
- Support for the F1H, CCC, E1x-FCC, E1X-FCC1, R1L variants.
- Target option to allow user selection of cross core interrupts.

Modified Features

The following features have been modified in this release:

- Moved compiler to only support the Wind River v5.9.4.0 (Diab) compiler.
- Compiler options used to build the RTA-OS library (see Port Guide section 6).
- Use of the compiler intrinsic functions instead of inline asm.
- Improves the RTA-OS API functions efficiency of moving between Untrusted and Trusted code in SC3/4 applications.
- Reduces the exit time of heavyweight tasks and suspending ECC tasks.
- Reduced transition time of ECC tasks entering and leaving the suspended state.
- Use of default interrupt with untrusted applications now supported.
- Rework the OS Size Information support to correct module size calculations and to report size of assembler modules in the OS library.

Removed Features

No features have been removed from this release.

3.10 Version 1.99.1

Additional Features

The following features have been added to this release:

- Second Early Access Release.
- Support for Category 1 CPU (EI and FE) exceptions and interrupts (i.e. vector addresses 0x10 to 0xF0).
- Support for memory and timing protection.
- Support for aligning stack to memory protection regions.
- Support for untrusted stack testing.
- Support for Direct Vector method interrupts.
- Support for overriding the default compiler SDA addressing settings.
- ORTI Support for the Lauterbach TRACE32 debugger.

Modified Features

The following features have been modified in this release:

- Moved compiler to only support the first official release of the Wind River v5.9.3.0 (Diab) compiler with the WIND00434341 patch.
- EBASE/RBASE modification now fully tested.
- Raw exception handler support now fully tested.
- Comments in the library asm files use '// ' rather than '# ' characters.
- RTA-OS libraries compiled using the RH850EN target processor setting.

Removed Features

No features have been removed from this release.

3.11 Version 1.99.0

Additional Features

The following features have been added to this release:

- Initial Early Access. Category 1 and 2 interrupts (Table reference method only). BCCx/ECCx Tasks. SC1 Autosar conformance. RTA-TRACE support

Modified Features

No features have been modified in this release.

Removed Features

No features have been removed from this release.

4 Fixed EHI Calls

Bugs that have been fixed are referred to by their call number in the ETAS Helpdesk International (EHI) system.

4.1 Version 2.0.4

EHI 534607

Status: Fixed

Title: iSYSTEM winIDEA User-Trace support for applications with untrusted code and the ShutdownHook and ProtectionHook

Description: The macros used to support tracking ORTI items with the iSYSTEM winIDEA profiler User-Trace caused a build error in applications with untrusted code and the ShutdownHook and ProtectionHook. This release has updated the use of these macros to correct this issue. Additional tests have been added to cover all possible use cases for these macros.

4.2 Version 2.0.3

EHI 495721

Status: Fixed

Title: Default RTA-OS Os_Cbk_GetAbortStack() code can return NULL

Description: In configurations that use the Os_Cbk_SetMemoryAccess callback to update the memory protection settings for untrusted code, but where the stack value is not actually passed to the callback (i.e. Stack Monitoring is disabled AND target option 'Enable stack repositioning' is false) a NULL value can be returned. This release has updated the default implementation of Os_Cbk_GetAbortStack() to fix this issue.

5 Limitations

5.1 Installer

There are the following limitations for the installer:

Limitation None.

Workaround None.

5.2 RH850WR DLL

There are the following limitations for this tool:

Limitation The v2.0.x releases support single core OS applications. Multi-core OS support will be added in the v5.0.x releases. Until that time multi-core applications are unsupported.

Workaround None.

Limitation Tests running applications on the D5EDv2 hardware found a limitation with multicore applications. If data is located in GRAM then the GRAM Write-Through buffer must be disabled otherwise there is an issue with code coherency between cores. This topic is currently under investigation at Renesas.

Workaround None.

Limitation The iSYSTEM User Trace (UTP) Profiling does not support tracking of Category 1 interrupts.

Workaround None.

Limitation The RTA-OS generated library code has been tested for incorrect code due to Wind River Defect TCDIAB-13458. The RTA-OS testsuite was rebuilt using both the v5.9.4.2 and v5.9.4.6 diagnostic versions of the compiler. TCDIAB-13458 related code issue were not found in any of the tested configurations. However the testsuite does not cover all possible permutations of generated code only the interesting test cases.

Assumption: RTA-OS is not affected by TCDIAB-13458 based on the execution of the complete RTA-OS testsuite with the diagnostic version of the compiler.

Obligation: All application code including the RTA-OS library should be tested with the diagnostic compiler tools to confirm that TCDIAB-13458 does not impact either the application code or the configured RTA-OS library.

Workaround None.

6 Contacting ETAS

6.1 Technical Support

Technical support is available to all users with a valid support contract. If you do not have a valid support contract, please contact your regional sales office (see Section 6.2.2).

The best way to get technical support is by email. Any problems or questions about the use of the product should be sent to:

`rta.hotline.uk@etas.com`

If you prefer to discuss your problem with the technical support team, you call the support hotline on:

+44 (0)1904 562624.

The hotline is available during normal office hours (0900-1730 GMT/BST).

In either case, it is helpful if you can provide technical support with the following information:

- Your support contract number
- Your .xml, .arxml, .rtaos and/or .stc files
- The command line which caused the error
- The version of the ETAS tools you are using
- The version of the compiler tool chain you are using
- The error message you received (if any)
- The file Diagnostic.dmp if it was generated

6.2 General Enquiries

6.2.1 ETAS Global Headquarters

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6.2.2 ETAS Local Sales & Support Offices

Contact details for your local sales office and local technical support team (where available) can be found on the ETAS web site:

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