IntervalZero

Product Release Notice

RTX64 4.5

General Availability Release Date

January 26, 2024

Product Overview

RTX64 4.5 is the latest 64-bit version of IntervalZero's market-leading hard real-time software products. This release provides several new features, usability improvements, and resolved issues.

To see a full list of all new features and a detailed list of new APIs added and issues resolved, please refer to the product release notes, found in the online RTX64 4.x Help.

Key Features

Runtime

General

- Verifies support for Windows 11 version 23H2. (11214)
- Verifies support for Intel® Elkhart Lake processors. (11249)
- Adds support for Intel® Advanced Matrix Extension (AMX). (11357)
- Verifies support for Intel® Xeon Scalable 4th generation processors. (11357)

Network and Drivers

- Adds support for MSI-X Single and Multi-Vector interrupts to i350 devices supported by the RtNalIGB driver. (11771, 11473)

Tools and Utilities

- Usability improvements to the RTX64 Activation and Configuration utility:
  - Adds logic to dynamically detect network connectivity. (6428)

- o Adds logic to display a warning dialog when an attempt is made to delete the last license for a given product component. (6427)
- o Improves the visual indicator used to denote the ideal license for a component. (11262)
- o Improves the error generated by the RTX64 Activation and Configuration command line utility, Rtx64ActivationUtil.exe, when a license file fails to import. (12810)
- o Addes functionality to RTX64 System Tray to check whether RTX64 services are present on the machine. When a service cannot be found, RTX64 System Tray displays a notification. To restore a missing service, you must reinstall RTX64. (7719)
- Improvements to RTX64 Analyzer:
  - o Adds Command Line parameters that allow you to choose how much information to collect in the output file. (9434, 10055)
  - o Adds logic to display the interrupt type of a network interface symbolically (e.g., MSI-X Single Vector, MSI-X Multi Vector, MSI, Line-based) instead of numerically (e.g., 1, 2, 3) in RTX64 Analyzer output. (12393)
  - o Improves the error message that appears when RTX64 Analyzer is terminated prematurely after having been launched from RTX64 Control Panel. (12987)
- Improvements to the RTX64 Control Panel:
  - o Adds tooltips to warning symbols. (11312)
  - o Improves the error message that appears when an attempt is made to enable two interfaces that share the same network device. (11167)
  - o Improves the error message that appears when the entered *MSpace memory allocated to the TCP/IP Stack heap* value does not meet the minimum requirement (2048 kilobytes). (12339)
  - o Adds a *Shut down immediately* option to the dialog that appears when you attempt to stop the Subsystem while processes are running. Using this option, Windows processes linked to RTX64 (aka Proxy Processes) are terminated before initiating shutdown handlers for any running real-time processes that have them. All other real-time processes are terminated in the order they were created. Once all shutdown handlers are completed, the Subsystem will continue its shutdown process. (12732, 7300)
- Improvements to RtssRun:
  - o Enhances RtssRun to display all output in the console in which RtssRun is executed, rather than in a separate dialog. If RtssRun is not executed in a console, or from a script executing in a console, a console will be created to display the output. (7316)
  - o Adds parameter */w*, which causes RtssRun to wait for the RTSS process it launches to complete before exiting. See RtssRun Usage for more information. (10310)
- Improvements to RTX64 Console:

- o Adds a Line Wrap feature, which allows you to wrap lines of text in the console output. (9426)
- o Adds functionality to the Find dialog, which you can use to optionally find only results that match the case of the keywords you want to find (using *Match case*) and search console output in a backward direction (using *Reverse search*). (10489)
- o Adds logic to retain user settings for *Text font*, *Text size*, *Line Wrap*, and *Save* location. (6352, 13290)
- Improvements to RTX64 Task Manager:
  - o Adds a *Parameters* column to the Running Tasks tab, which displays the command line parameters associated with a task. (11281)
  - o Adds logic to retain recent process history for running tasks and the last known browse location for new and scheduled tasks on a per-user basis. (11213)

Software Development Kit

Application Development

- Enhances the RTX64 templates for creating Real-time Applications and RTDLLs for supported Visual Studio versions to ensure unique GUIDs (Global Unique Identifiers) are assigned to each project file within a solution. (12694)

Tools and Utilities

- Adds several usability improvements to the RTX64 SDK Welcome Screen. (11475)

Real-Time APIs

- Adds function RtGetCurrentHalTimerPeriod, which returns the current HAL timer period value used by the Subsystem. (11111)

Native Framework APIs

- Adds Native function RtfwStopSubsystemForce, which forces the RTX64 Subsystem to stop, even if RTSS processes or Windows processes linked to RTX64 are still running. This will initiate any registered shutdown handlers and wait for them to complete before the Subsystem fully stops. (12722)

Managed Framework APIs

- Adds method StopForce to Managed class IntervalZero.RTX64.Control.Subsystem, which stops the Subsystem, even if RTSS processes or Windows processes linked to RTX64 are still running. This will initiate any registered shutdown handlers and wait for them to complete before the Subsystem fully stops. (12727)

Issues Resolved

Runtime

Installation

- Resolves an issue where modifying the RTX64 Runtime installation to add the RTX64 Remote Debugger component resulted in a missing registry key. (15582)

Subsystem

- Resolves an issue where the system would sometimes crash due to an RTSS proxy thread page fault during application termination. This issue was seen when RTSS applications were started and stopped repeatedly from a Windows script. (16281)
- Resolves an intermittent Subsystem crash that occurred under reboot stress conditions when Windows was assigned 5 or more cores in the RTX64 boot configuration and two lines of code that needed to be executed on the same Windows core could not execute. (12936)
- Resolves a non-paged memory leak that occurs because of RTSS process objects not being cleaned up correctly under stress conditions. (16678)
- Resolves an issue where RTX64 did not display a notification or log an event in some cases where RTX64 corruption was detected. (8952)

Network and Drivers

- Resolves an issue where i210 devices failed to generate interrupts when in MSI-X mode. (11476)
- Resolves an issue where running high-volume throughput receive on the RTX64 Realtek driver (RtNalRtl) caused the Subsystem to hang. (11470)

Tools and Utilities

- Resolves these issues with the RTX64 Control Panel:

- o Resolves an issue where running processes could not be forcibly terminated on Subsystem stop when the Network Abstraction Layer (NAL) was running. (12805)
  - o Resolves an issue where the Subsystem Start and Stop buttons were both enabled when the Subsystem was started by a source outside the RTX64 Control Panel. (11489)
  - o Resolves an issue where changing the *Run in verbose mode* setting on the Configure and Control the Network page did not prompt a Restart Subsystem notification. (11515)
  - o Resolves an issue where the RTX64 Control Panel allowed invalid characters in some input fields. (12368, 12359, 12354, 12349, 12344, 11131)
  - o Improves the error message that appears when the NIC *Location* field on the *Manage interfaces* screen is blank. (12952)
  - o Improves the error message that appears when the Subsystem is stopped through the RTX64 Control Panel when the Process Memory Allocation Space *Auto-expand MSpaces* setting is disabled and the Process Memory Allocation Space *Minimum size for internal MSpace* setting is configured to 64 KB. (12967)
  - o Resolves an issue where stopping the Subsystem while RTX64 Analyzer was running caused the RTX64 Control Panel to freeze. (7002)
  - o Resolves an issue where the *Set the IP reassembly timeout* value would revert to an incorrect value (64) when reset to factory defaults. (11524)
- Resolves issues with the RTX64 Activation and Configuration utility:
  - o Resolves an issue where the Activate button under *Activate over the network* would remain disabled when a valid activation key was entered. (11129)
  - o Resolves an issue where the RTX64 Activation and Configuration utility did not display an error when an attempt was made to activate components with a dongle from a remote connection, an unsupported use case. (8545)
  - o Resolves an issue where the RTX64 Activation and Configuration utility displayed an error when successfully importing a license file over Remote Desktop Protocol (RDP) to a connected dongle. (12708)
  - o Resolves an issue where the default core assignment in the RTX64 Activation and Configuration utility showed more cores assigned to RTX64 than was specified in the product license. (13144)
- Resolves issues with the Rtx64ActivationUtil.exe command line utility:
  - o Resolves an issue where Rtx64ActivationUtil.exe did not provide feedback when a fingerprint file was successfully exported. (7643)
  - o Resolves an issue where Rtx64ActivationUtil.exe allowed a user to assign more processors to RTX64 than was allowed by the license file. (6454)
- Resolves issues with RTX64 Task Manager:

- Improves the error message displayed by RTX64 Task Manager when a scheduled task's maximum value for the expand memory size is greater than the maximum allowed (3/4 of the amount of RAM in the system or 4 GB, whichever is smaller). (11209)
- Resolves an issue where the *Remove task* button was enabled when no task was selected. (11140)
- Improves the scrolling behavior in the *Running tasks* tab when task information is expanded. (11139)
- Resolves issues with the expand/collapse task information toggle in the *Running tasks* tab. (11138)

Software Development Kit

General

- Resolves an issue where RTX64 SDK Welcome Screen settings were not removed when RTX64 SDK was uninstalled. (11970)

Application Development

- Resolves an issue where calling the EnableInterruptFromSpecifiedMessage() routine in MSIX Multi-Vector interrupts corrupted the volatile R9 register. This issue occurred when building the EnableInterruptFromSpecifiedMessage() routine in the Release configuration. When the issue was encountered, calling RtAttachInterrupt with *AttachVersion* set to ATTACH_MESSAGE_BASED_MULTI_VECTOR took a long time to return. (13095)

Real-time APIs

- Resolves an issue where CreateFile failed to retrieve a device handle to a physical drive. (13525)

Windows Supported APIs

- Resolves an issue where Windows-supported API GetFileAttributes would sometimes fail with ERROR_INVALID_HANDLE in scenarios where ERROR_FILE_NOT_FOUND was the expected error. (11488)

Native Framework APIs

- Resolves an issue where function RtfwGetSubsystemStatus would return a Transitioning status during simultaneous multi-threaded calls to the function. (11212)

Availability

RTX64 4.5 is available beginning January 26, 2024, through Partners and by contacting Sales: sales@intervalzero.com.

We look forward to any comments and feedback. If you have any recommendations, or wish to suggest any product enhancements, please contact Product Management at: productmanagement@intervalzero.com.