

RTX Features by Release

Operating System Support for Supported RTX Runtime Versions

Note that RTX Runtime only supports 32-bit operating systems.

| | RTX 2011 | RTX 2011 SP1 | RTX 2012 | RTX 2012 with Updates | RTX 2016 |
|---------------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|-------------------------|
| Windows 10 | No | No | No | No | No |
| Windows 8.1 | No | No | No | No | No |
| Windows Embedded Standard 8 | No | No | No | No | No |
| Windows 7 | Yes (SP1 ³) | Yes (SP1 ³) | Yes (SP1 ³) | Yes (SP1 ³) | Yes (SP1 ³) |
| Windows Embedded Standard 7 | Yes (SP1 ³) | Yes (SP1 ³) | Yes (SP1 ³) | Yes (SP1 ³) | Yes (SP1 ³) |
| Windows Vista | Yes (SP1, SP2) ³ | Yes (SP1, SP2) ³ | Yes (SP1, SP2) ³ | Yes (SP2) ³ | No |
| Windows Server 2003 | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) | Yes (R2, SP2 ²) | No |
| Windows Embedded Standard 2009 | Yes | Yes | Yes | Yes | No |
| Windows XP Professional | Yes (SP3 ³) | Yes (SP3 ³) | Yes (SP3 ³) | Yes (SP3 ³) | No |
| Windows XP Embedded | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP2) | No |

²: Supports RTX MP Dedicated environments only. Support for shared UP and MP APIC systems added to a subsequent release.

³: Does not support PIC systems.

Microsoft Visual Studio Support for Supported RTX SDK Versions

| | RTX 2011 | RTX 2011 SP1 | RTX 2012 | RTX 2012 with Updates | RTX 2016 |
|---------------------------|-----------|--------------|-----------|--------------------------|----------|
| Visual Studio 2015 | No | No | No | No | Yes |
| Visual Studio 2013 | No | No | No | No | Yes |
| Visual Studio 2012 | No | No | No | Yes (Build support only) | No |
| Visual Studio 2010 | Yes | Yes | Yes | Yes | No |
| Visual Studio 2008 | Yes (SP1) | Yes (SP1) | Yes (SP1) | Yes (SP1) | No |
| Visual Studio 2005 | Yes | Yes | Yes (SP1) | Yes (SP1) | No |

Key Features in Supported RTX Versions

| | RTX 2011 | RTX 2011 SP1 | RTX 2012 | RTX 2012 with Updates | RTX 2016 |
|---|----------|--------------|----------|-----------------------|----------|
| Licensing through PAC | Yes | Yes | No | No | No |
| Licensing through 3rd Party | No | No | Yes | Yes | Yes |
| Licensing through Standard Dongles | No | No | No | Yes | Yes |

| | RTX 2011 | RTX 2011 SP1 | RTX 2012 | RTX 2012 with Updates | RTX 2016 |
|--|----------|--------------|----------|-----------------------|----------|
| Licensing through Small Form Factor Dongles | No | No | No | No | Yes |
| Using Windows groups for Security | No | No | Yes | Yes | Yes |
| Shared Mode | Yes | Yes | Yes | Yes | No |
| Dedicated Mode (up to 32 total processors) | Yes | Yes | Yes | Yes | Yes |
| Visual Studio Debugger Support for Launch | Yes | Yes | Yes | Yes | Yes |
| Visual Studio Debugger Support for Attach | No | No | Yes | Yes | No |
| Structured Exception Handling | Yes | Yes | Yes | Yes | Yes |
| Floating Point Support | Yes | Yes | Yes | Yes | Yes |
| Supports MMX, SSE/SSE2/SSE3/SSE4 | Yes | Yes | Yes | Yes | Yes |
| Supports AVX | No | Yes | Yes | Yes | Yes |
| Deterministic Memory Allocation | Yes | Yes | Yes | Yes | Yes |

| | RTX 2011 | RTX 2011 SP1 | RTX 2012 | RTX 2012 with Updates | RTX 2016 |
|---|----------|--------------|----------|-----------------------|----------|
| Plug and Play Device Support | Yes | Yes | Yes | Yes | Yes |
| Line-based Interrupt Support | Yes | Yes | Yes | Yes | Yes |
| Message-based & Extended Message-based Interrupt Support | Yes | Yes | Yes | Yes | Yes |
| Properties Library | Yes | Yes | Yes | Yes | Yes |
| Control Panel | Yes | Yes | Yes | Yes | Yes |
| Activation and Configuration Utility | No | No | Yes | Yes | Yes |
| RTSS Task Manager | Yes | Yes | Yes | Yes | Yes |
| RTX Server | Yes | Yes | Yes | Yes | Yes |
| RTSS Object Viewer | Yes | Yes | Yes | Yes | Yes |
| RTX Platform Evaluator | Yes | Yes | Yes | Yes | Yes |
| RTX Time View | Yes | Yes | Yes | Yes | Yes |

| | RTX 2011 | RTX 2011 SP1 | RTX 2012 | RTX 2012 with Updates | RTX 2016 |
|------------------------------|-----------------|---------------------|-----------------|------------------------------|-----------------|
| RTSS Performance View | Yes | Yes | Yes | Yes | Yes |
| RTX Analyzer | Yes | Yes | Yes | Yes | Yes |
| IPv4 Support | Yes | Yes | Yes | Yes | Yes |
| IPv6 Support | Yes | Yes | Yes | Yes | Yes |
| Raw Socket Support | Yes | Yes | Yes | Yes | Yes |

Operating System Support for RTX Runtime Versions No Longer Supported

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|---------------------------------------|-----------------|-----------------|------------------------|------------------------|---------------|---------------|--------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Windows 7 | No | No | No | No | No | No | No | No | No | No | No | No | Yes ^{2,3} | Yes ³ |
| Windows Embedded Standard 7 | No | No | No | No | No | No | No | No | No | No | No | No | No | Yes ³ |
| Windows Vista | No | No | No | No | No | No | Yes ^{2,3} | Yes ³ | Yes ³ | Yes ³ | Yes ³ | Yes (SP1, SP2) ³ | Yes (SP1, SP2) ³ | Yes (SP1, SP2) ³ |
| Windows Server 2003 | No | No | No | No | Yes (SP1, R2) | Yes (SP1, R2) | Yes (SP1, R2) | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) | Yes (SP1, SP2 ²) |
| Windows Embedded Standard 2009 | No | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | Yes |
| Windows XP Professional | Yes (Base, SP1) | Yes (Base, SP1) | Yes (Base, SP1 or SP2) | Yes (Base, SP1 or SP2) | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP3) | Yes (SP3) | Yes (SP3) | Yes (SP3) | Yes (SP3 ³) | Yes (SP3 ³) |
| Windows XP Embedded | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Windows 2000 Server | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP4) | Yes (SP4) | Yes (SP4) | Yes (SP4) | Yes (SP4) | Yes (SP4) | No | No | No |
| Windows 2000 Professional | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP2) | Yes (SP4) | Yes (SP4) | Yes (SP4) | Yes (SP4) | Yes (SP4) | Yes (SP4) | Yes (SP4) | No | No | No |

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|--|------------|------------|-----|-------|-----|-----|-----|-----|-------|-------|------------------|------|----------|----------|
| Windows NT 4.0 Server | Yes (SP6a) | Yes (SP6a) | No | No | No | No | No | No | No | No | No | No | No | No |
| Windows NT Embedded Workstation | Yes (SP5) | Yes (SP5) | No | No | No | No | No | No | No | No | No | No | No | No |
| Windows NT 4.0 Workstation | Yes (SP6a) | Yes (SP6a) | No | No | No | No | No | No | No | No | No | No | No | No |

²: Supports RTX MP Dedicated environments only. Support for shared UP and MP APIC systems added to a subsequent release.

³: Does not support PIC systems.

Microsoft Visual Studio Support for RTX SDK Versions No Longer Supported

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|---------------------------|-----|-------|-----|-------|-----|-----|-----|-----|-------|-------|------------------|------|----------|-----------|
| Visual Studio 2012 | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Visual Studio 2010 | No | No | No | No | No | No | No | No | No | No | No | No | No | Yes |
| Visual Studio 2008 | No | No | No | No | No | No | No | No | No | Yes | No | Yes | Yes | Yes (SP1) |

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|---|-----|------------------|------------------|-------|-----|-----|-----|-----|-------|-------|------------------|------|----------|----------|
| Visual Studio 2005 | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Visual Studio .NET 2003 | No | Yes ⁵ | Yes ⁵ | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Visual Studio .NET 2002 | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No | No |
| Visual Studio 6.0 Service Pack 5 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No | No | No |

⁵: Wizards provided, but no debug support

Key Features in RTX Versions No Longer Supported

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|---|-----|-------|-----|-------|-----|-----|-----|-----|-------|-------|------------------|------|----------|----------|
| Licensing through PAC | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Licensing through 3rd Party | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Licensing through USB Dongles | No | No | No | No | No | No | No | No | No | No | No | No | No | No |

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|---|-----|-------|-----|-------|-----|-----|-----|-----|-------|-------|------------------|------|----------|----------|
| Using Windows groups for Security | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Shared Mode | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Dedicated Mode (1 processor RTX) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Dedicated Mode (up to 7 processors RTX) | No | No | No | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes |
| Dedicated (Cluster) Mode (up to 32 total processors) | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Visual Studio Debugger Support for Launch | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Visual Studio Debugger Support for Attach | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Structured Exception Handling | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|---|-----|-------|-----|-------|-----|-----|-----|-----|-------|-------|------------------|------|----------|----------|
| Floating Point Support | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Supports MMX, SSE/SSE2/SSE3/SE4 | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Supports AVX | No | No | No | No | No | No | No | No | No | No | No | No | No | No |
| Deterministic Memory Allocation | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Plug and Play Device Support | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Line-based Interrupt Support | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Message-based & Extended Message-based Interrupt Support | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Properties Library | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Control Panel | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Activation and Configuration Utility | No | No | No | No | No | No | No | No | No | No | No | No | No | No |

| | 5.5 | 6.0.1 | 6.1 | 6.5.1 | 7.0 | 7.1 | 8.0 | 8.1 | 8.1.1 | 8.1.2 | 9.0 ⁴ | 2009 | 2009 SP1 | 2009 SP2 |
|-------------------------------|-----|-------|-----|-------|-----|-----|-----|-----|-------|-------|------------------|------|----------|----------|
| RTSS Task Manager | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RTX Server | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RTSS Object Viewer | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RTX Platform Evaluator | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RTX Time View | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RTSS Performance View | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| RTX Analyzer | No | No | No | No | No | No | No | No | No | No | No | No | Yes | Yes |
| IPv4 Support | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| IPv6 Support | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Raw Socket Support | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

RTX Features by Release

RTX 2016

Key Features Added

- Added Visual Studio 2015 build and debug support, including:
 - Visual Studio templates for creating a RTX Application and RTDLL.
 - Support for statically linked Debug and Release versions of the Microsoft Visual Studio C Runtime.
 - Added Snippets for some key RTAPI function calls.
 - Added debugging support through launch.
 - Added support for Start Without Debugging within the Visual Studio debugger.
 - Added support for launching a RTSS process on a remote target system for debugging.
- Added Visual Studio 2013 build and debug support, including:
 - Visual Studio templates for creating a RTX Application and RTDLL.
 - Support for statically linked Debug and Release versions of the Microsoft Visual Studio C Runtime.
 - Added Snippets for some key RTAPI function calls.
 - Added debugging support through launch.
 - Added support for Start Without Debugging within the Visual Studio debugger.
 - Added support for launching a RTSS process on a remote target system for debugging.

Key Features Removed

- Removed the concept of Shared configuration modes.
- Removed support for Visual Studio versions 2012, 2010, 2008, and 2005.

RTX 2012 with Update 4

This update resolves product issues. No new features have been added.

RTX 2012 with Update 3

This update resolves product issues. No new features have been added.

RTX 2012 with Update 2

This update resolves product issues. No new features have been added.

RTX 2012 with Update 1

Key Features

- The RTX Activation and Configuration utility now checks for a connection to the IntervalZero license server and includes support for proxy servers. (RTX-1409, 1222)
- The RTX Activation and Configuration utility now contains additional diagnostic information to help with licensing issues. (RTX-1335)
- Added support for product licensing through USB dongles. (RTX-1410)
- Allowed for pre-configuration of the RTX subsystem without the subsystem being licensed. (RTX-1633)
- Provided a new real-time network driver RtIGB to support:
 - Intel i210 Ethernet Controllers
 - Intel i350 Ethernet Controllers (RTX-1390, 1279)
- Added support for Intel 82575EB Gigabit Network controller within the Rt8257x driver. (RTX-1239)
- Added new Real-time API functions:
 - RtGetLicenseFeatureStatusEx – obtains the status of the license for the product feature specified by parameter *featureName*.
 - RtWaitForSingleObjectEx – allows a thread to wait on an object to be signaled with 100 nanosecond granularity time-out interval.
 - RtWaitForMultipleObjectsEx – allows a thread to wait on one of multiple objects to be signaled with 100 nanosecond granularity time-out interval.
- Added Visual Studio 2012 build support, including:
 - RTX64 Application wizard
 - Support for statically linked Debug and Release versions of the Microsoft Visual Studio C Runtime
- Expanded samples and inclusion of projects for Visual Studio 2010 and 2012. (RTX-1417)

RTX 2012

Key Features

- RTX system features and components are now licensed through the RTX Activation and Configuration utility, which requires a valid activation key. If the Subsystem is not licensed, you cannot run RTSS applications or register RTDLLs. For more information, see the RTX 2012 Install Guide.
- You now configure the number of processors available to Windows and RTX during product activation through the RTX Activation utility. Previously, this was done during product installation. For more information, see the RTX 2012 Install Guide.
- RTSS applications and RTDLLs now require a valid SDK license to be built and run. If a valid license does not exist, the RTSS or RTDLL cannot be run or registered. You license an RTSS and RTDLL by stamping it with the StampTool.exe utility. Projects built in versions prior to RTX 2012 must be manually stamped using StampTool as part of the build process. For more information, see the product documentation.
- RTX now supports user groups. By default, all users are members of the RTXAdministrators, RTXUsers and RTXDebuggers groups. These groups should be modified to only include necessary users. For more information, see the RTX 2012 Install Guide.
- RTX now includes a system-wide debugger for all supported versions of Microsoft Visual Studio. The new RTX Debugger:
 - Allows you to attach the Visual Studio debugger to a running RTSS process.
 - Allows you to launch and attach to multiple RTSS processes simultaneously in the same Visual Studio instance.
 - Uses Microsoft transports. You no longer need to select transports differently for debugging an RTSS process.
 - Supports the following breakpoints:
 - A function breakpoint causes the program to break when execution reaches a specified location within a specified function.
 - A file breakpoint causes the program to break when execution reaches a specified location within a specified file.
 - An address breakpoint causes the program to break when execution reaches a specified memory address.
 - A data breakpoint causes the program to break when the value of a variable changes. You can set a data breakpoint on a global variable or a local variable in the top-most scope of a function. (C++ only)

For more information on RTX Debugger functionality, see *Debugging with Visual Studio* in the product documentation.

- The RtssArp Utility has been modified to support an infinite Time To Live (TTL) value.
- A stamping tool (StampTool.exe) is provided to stamp binaries so they can be run. RTX Wizards have also been updated to include the stamping tool as a post build step. For more information, see the product documentation.
- The structure STARTUPINFOEXE is now supported within RtCreateProcess. Three new API functions were added to support this new structure:
 - RtInitializeProcThreadAttributeList

- RtUpdateProcThreadAttributeList
- RtDeleteProcThreadAttributeList
- A new RTX Properties API function, RtcplGetLicenseInfo, is available to provide an array of licensed features.
- The Win32 API function OutputDebugString is now supported. This function sends a string to the debugger for display.

RTX 2011 with Service Pack 1 Update 6

This update resolves product issues. No new features have been added.

RTX 2011 with Service Pack 1 Update 5

Key Features

- Added new Wait object API calls that allow for wait times values in the 100 ns range:
 - RtWaitForSingleObjectEx
 - RtWaitForMultipleObjectsEx

RTX 2011 with Service Pack 1 Update 4

This update resolves product issues. No new features have been added.

RTX 2011 with Service Pack 1 Update 3

This update resolves product issues. No new features have been added.

RTX 2011 with Service Pack 1 Update 2

This update resolves product issues. No new features have been added.

RTX 2011 with Service Pack 1 Update 1

This update resolves product issues. No new features have been added.

RTX 2011 with Service Pack 1

Key Features

- Added support for Windows 7 Service Pack 1
- You can now configure the number of processors available to Windows and RTX during installation of RTX
- Functionality has been added to control how local memory is allocated in the RTX subsystem, including whether or not to automatically increase the local memory pool when it is exhausted. You can configure this through the Memory tab in the RTX Properties control panel. Additionally, the subsystem now generates a notification when it is unable to allocate the requested default local memory pool size.
- RTX now fully supports Intel® Advanced Vector Extensions (AVX) including exception handling. For more information, see the AVX, SSE and MMX Support topic in the *RTX Application Development Guide*.
- RTX now supports Streaming SIMD Extensions (SSE) exception handling. SSE exceptions are controlled by the SIMD status and control register. For more information, see the AVX, SSE and MMX Support topic in the *RTX Application Development Guide*.
- The RtE1000 driver now supports the 82571 EB Intel Pro 1000 PT Quad Port LP Server adapter
- The RTX 8257x and 82580 network drivers are now part of the RTX product. They were previously available as standalone installs
- Source for the RTX 8257x and 82580 network drivers are available as part of the driver source
- New RTX Properties API functions are available for controlling the local memory pool size:
 - RtcplGetAutoExpandLocalPool - Retrieves the behavior of the local memory pool when it is exhausted
 - RtcplGetLocalPoolExpansionSize - Retrieves the size, in bytes, by which the local memory pool expands when it is exhausted
 - RtcplSetAutoExpandLocalPool - Determines whether or not the local memory pool automatically expands when a memory allocation request requires more memory than is available in the local memory pool
 - RtcplSetLocalPoolExpansionSize - Determines the minimum number of bytes by which the local memory pool expands when it is exhausted
- A new RTAPI function, RtExpandLocalMemory(Size), is available for forcing growth of the local memory pool within RTSS applications
- A new RTX Properties API function, RtcplGetProductInfo, is available for retrieving the RTX product type and version.

- RTX managed code now provides a pointer to the shared memory region in addition to the streaming functions. This allows managed code to access the shared memory directly using unsafe pointers.
- The RTX Quick Start Guide has been updated and is now available in the online documentation. It is no longer provided as a separate .pdf document.
- A new Quick Start video, *RTX Quick Start*, walks you through the basic steps required to build and run a simple application. This video is installed with RTX and is also available from the IntervalZero website at <http://www.intervalzero.com/videolibrary.htm>.
- A new overview video, *Getting Started with RTX*, introduces the various RTX components and provides an overview of the workflow. This video is installed with RTX and is also available from the IntervalZero website at <http://www.intervalzero.com/videolibrary.htm>.
- A new video tutorial, *Developing RTX Applications Remotely Across a Host/Target Connection*, walks you through the steps required to configure a 32-bit host machine to receive remote debug connections from a 64-bit target machine. This video is available from the IntervalZero website at <http://www.intervalzero.com/videolibrary.htm>.

RTX 2011

Key Features

- IntervalZero now provides six editions of the RTX 2011 product, listed in the table below.

| The edition... | Includes support for real-time operations on... |
|-------------------------------|---|
| RTX 2011 Runtime Solo | One shared or dedicated RTX processor in a uniprocessor or multicore/multiprocessor environment |
| RTX 2011 Runtime Entry | One shared or two dedicated RTX processors in a multicore/multiprocessor environment |
| RTX 2011 Runtime Basic | One shared or three dedicated RTX processors in a multicore/multiprocessor environment |
| RTX 2011 Runtime Professional | One shared or seven dedicated RTX processors in a multicore/multiprocessor environment |
| RTX 2011 Runtime Premium | One shared or 15 dedicated RTX processors in a multicore/multiprocessor environment |
| RTX 2011 Runtime Ultimate | One shared or 31 dedicated RTX processors in a multicore/multiprocessor environment |

- RTX can now run on systems with up to 32 processors:
 - Systems with eight or fewer processors, which do not have hardware enforced processor clustering, can run in Shared or Dedicated mode. A dedicated system can assign from one to seven processors to Windows and the remaining to RTX.
 - Systems with more than eight processors (but not more than 32) or systems with eight or fewer processors which have hardware enforced processor clusters can run in Dedicated (Cluster) mode only. On these systems, a maximum of four processors can be assigned to Windows and up to 31 can be assigned to RTX.
- The tutorial *Including RTX Runtime with Windows Embedded Standard 7* is available to demonstrate how to include RTX with Windows Embedded Standard 7 using ICE.
- RTX development tools are now available as part of the Runtime edition.
- RTX tools and utilities have been updated to support the display of 31 processors.
- RTX now provides FastSemaphores for lightweight thread synchronization within a single process.
- Functionality has been added within the RTX Properties control panel so tracing capabilities can be enabled at subsystem startup or only during a logging session. New RTX Properties APIs have also been added to programmatically support this functionality.
- RTX now allows for the minimum number of process slots to be 1 (the previous minimum was 10).
- The RTX Properties control panel has been updated to provide more detailed system status information.
- New functionality has been added to the subsystem shutdown process to clean up proxy processes in a more systematic manner.
- RTX Supplemental Win32 for C Runtime Library (slot 10) has been removed the functionality has been incorporated into the Real-Time Win32 API library.
- Providing Installation Merge modules so customers can more fully integrate RTX runtime into their product installation.
- The RTX SDK without the Runtime selected can be installed on a 64 bit Windows Operating System.
- The API calls now support masks that represent up to 31 RTSS processors.
- RTX now support the dynamic loading and unloaded of Rtapi_w32.dll within a windows application.
- Sample applications are now installed in a user-editable directory based on the Windows Operating system.
- Provided a busy wait function for NIC drivers to improved data transfer.

RTX 2009 with Service Pack 2 Update 3 (no longer supported)

Key Features

- The RT-TCP/IP stack now allows for the monitoring of network device interfaces for link status via new fields in the RT-TCP/IP INI file.
- Two new real-time Network API calls have been added that allow you to determine the status of the stack and drivers:
 - RtnIsDeviceOnline
 - RtnIsStackOnline
- A new feature was integrated into RtssARP command line utility, by allowing the -t switch to accept -1, the ARP timeout value becomes 0xFFFFFFFF, which is essentially infinity.

RTX 2009 with Service Pack 2 (no longer supported)

Key Features

- Windows 7 shared configurations are supported for multiprocessor (MP) and uniprocessor (UP) APIC systems (RTX does not support uniprocessor PIC systems).
- A new network driver has been provided to support a subset of the Marvell Yukon PCI Express Ethernet controllers.
- Improvements have been made to how system frequency is measured when Intel® Turbo Boost Technology is enabled.
- Support has been added for Visual Studio 2010 through wizards, a C runtime library and a debugger Add-in.
- The RTX Debugger Add-in provides the ability to set thread affinity and ideal processor for the main thread of the process that is being debugged.
- The RTX Debugger Add-in provides the ability to set the ideal processor for the internal debugger threads
- RtTraceEvent is supported from Win32 applications.

RTX 2009 with Service Pack 1 (no longer supported)

Key Features

- Windows 7 dedicated support
- Configurable priority inversion protocol
 - Priority promotion disabled
 - Priority promotion with limited demotion
 - Priority promotion with tiered demotion
- Physical Address Extension (PAE) support for dedicated configurations
- Win32 Managed code support
- RtxAnalyzer provided as part of the runtime
- Sample to convert TimeView output to file readable by TimeDoctor
- RtK API now has a function RTSSRtkAttachEx that allows for notification of subsystem shutdown
- RtTraceEvent callable from Windows application linked to RTX
- API to support registry access from RTSS application
- Visual Studio 2005 and 2008 C runtimes now support the memory `__aligned_XXX` functions

RTX 2009 (no longer supported)

Key Features

- RTX Runtime is available in two versions (can only be installed on systems with up to 8 processors)
- RTX 2009 supports uniprocessor or multiprocessor systems, the subsystem will run on a single processor in shared or dedicated mode
- RTX 2009 SMP supports uniprocessor or multiprocessor systems, the subsystem can run on 1 processor in shared mode or up to 7 processors in dedicated mode
- Added support for Microsoft Vista, SP1 and SP 2 (no support in Vista on PIC systems)
- Added support for Microsoft Windows XP SP3
- Added support to set default behavior on devices with both MSI and MSI-x
- Improved stability of loading and unloading of the subsystem on multiprocessor systems
- Support for Microsoft Visual Studio 2008
 - C Runtime
 - Development Wizards (application, device, and network driver)
 - Debugger Add-in (local and host-target)

RTX 9.0 Limited Availability (no longer supported)

Key Features

- Expanded support of SMP/MP Dedicated such that the RTSS subsystem can now run on multiple dedicated CPUs. Up to 7 CPUs can be dedicated to RTSS.
- Addition APIs provided to take advantage of multiple dedicated RTX processors (GetProcessAffinityMask, SetProcessAffinityMask, SetThreadAffinityMask, SetThreadIdealProcessor, RtCreateTimerEx, RtGetProcessAffinityMask, and RtSetProcessAffinityMask)
- Updated RTX tools to support an SMP environment (RTX Platform Evaluator , RTSS Performance View , RTSS Object Viewer, RtssRun, RtssKill, and RTX Properties Control Panel)
- RTX Properties Control Panel allows you to configure your system for shared or dedicated mode and specify the number of RTSS processors you will have if you use dedicated mode. Manual changes to the boot.ini or use of BCDedit are not necessary
- Non-admin users can run RTX tools and use the RTX Properties control panel through use of the RTX User Account Control Override service
- RTX Time View has been enhanced to allow it to run until it has been manually stopped or the system has crashed

- RTSS Object Viewer now provides thread duration information
- Modifications to the PnP driver that allow you to configure devices so that they do not request line-based resources (even if the device is not MSI-capable)
- These new APIs for profiling across processors (RtGetThreadTimes, QueryPerformanceCounter and QueryPerformanceFrequency)
- The ability to disable debug hooking completely (debug hooking caused issues with some security dongles)

RTX 8.1 Service Pack 2 (no longer supported)

Key Features

- Visual Studio 2008 Support
 - C Runtime
 - Development wizards (application, device, and network driver)
 - Debugger add-in (local and host-target)
- Support for the Intel Compiler
- Improved RTK support
 - Added subsystem shutdown notification through RtkRtssAttachEx
 - Added PNP automatic boot time start up support
- Improved start stop stability of the RTX subsystem
- Control Panel provides addition information on the status of MSI/MSI-X devices
- Allow for filtering out of device IO port resources

RTX 8.1 Service Pack 1 (no longer supported)

Key Features

- Support for XP SP3
- Improved ability to defeat Intel Speed Step in RTX Shared configurations
- Optimized local memory and heap access
- Fixed issues with RtDeleteTimer being unable to terminate a handle
- Modified Visual Studio 6.0 and 2005 to allow memory allocation to be freed across DLL boundaries
- Modified how RTX handles Guard pages on certain operating systems
- Improved upon RAW Socket implementation

RTX 8.1 (no longer supported)

Key Features

- Supports MP shared configurations on Windows Vista machines
- Message-based interrupt functionality that supports MSI/MSI-X capable devices. RTX supports this functionality on all of its supported operating systems, Windows 2000 through Vista.
- Supports RTX Hal timer periods as small as 1 microsecond on APIC systems
- Supports MMX and SSE/SSE2/SSE3 functionality
- Supports 1394 and USB connection options when kernel debugging using WinDbg
- RT-TCP/IP Enhancements
 - Supports RAW sockets in the RT-TCP/IP stack
 - Supports jumbo frame sizes larger than 1500 bytes in the RT-TCP/IP stack
 - Supports the WSAEventSelect
 - Elimination of the eight driver limit in the RT-TCP/IP stack – up to 255 different drivers now
 - Ability to assign multiple IP addresses to a single network device
 - Ability to configure multiple network interface cards to use the same subnet
 - RT-TCP/IP stack now supports scenarios where no devices are required
 - TCP/IP changes to allow users to modify the frequency of ACKs

- Automatic creation, during install, of a custom power state when installing on Windows Vista machines
- Improved device I/O control support
- Improved ability to defeat the Intel Speed Step feature when in RTX Shared mode
- Optimizations to local memory and heap access

RTX 8.0 (no longer supported)

Key Features

- Supports MP Dedicated and UP APIC on Vista machines
(Vista does not support PIC or MP Shared)
- Supports Windows 2003 SP2 for MP dedicated
- RT-TCP/IP Enhancements:
 - Supports zero copy filter drivers
 - Address Resolution Protocol (ARP) table's cache size is now configurable
 - Rt82543gc driver supports the use of location information
 - Subnetting is now allowed for the IPv6 address
 - Ability to configure MTU, TTL, and TCPKeep alive from the RT-TCP/IP ini file
- NIC card support has been added for:
 - 82571 Intel Gigabit Ethernet Controller
 - DP83816 National semiconductor 10/100 Mb/s Ethernet Controller
- RT-TCPIP utilities, including:
 - RtssArp displays and modifies the IP-to-Physical address translation tables used by the address resolution protocol (ARP)
 - RtssIpConfig displays the local computer's current network configuration
 - RtssPing sends ICMP Echo or ICMPv6 Echo request messages to assist you in performing network diagnostics and to test the ability to reach a specific destination
 - RtssRoute displays and manipulates network routing tables
- Supports these API calls:
 - gai_strerror – returns a text string describing an error value
 - RtGetCurrentProcessorNumber – helps to determine the processor on which the RTX subsystem is running

RTX 7.1 (no longer supported)

Key Features

- RT-TCP/IP Enhancements:
 - Supports next-generation Internet Protocol, IPv6
 - Dual IPv4-IPv6 TCP/UDP/IP stack
 - Improved TCP transport algorithms
 - Improved performance by implementing zero-copy
 - Device Driver Filter Layer – allows for MAC-level Transmits and Receives
- NIC Card Support Added for:
 - Intel 82541 and 82547
 - Intel 82572 and 82573
 - Intel 82546 Dual Controller
 - Intel 82562ET
 - National Semiconductor DP83820
 - RealTek 8169 and 8110
 - VIA VT610x
- RTX Network Driver Wizard
 - Helps users create custom drivers
 - Provided for Microsoft Visual Studio 6.0, .NET (2002), .NET 2003, and 2005
- RTSS Object Viewer has been upgraded to provide subsystem memory information
- Platform Evaluator is now supported on MP systems.

RTX 7.0 (no longer supported)

Key Features

- Visual Studio 2005 Support
 - Wizards (application and device)
 - C Runtime support

- Local debugging within Microsoft Visual Studio
- Supports Host-Target debugging in Microsoft Visual Studio .NET 2003 and Visual Studio 2005
- WinDbg data extension
- PerformanceView – a utility to view RTX CPU usage
- Improved exception handling (stop at first exception)
- Properties library – a DLL that allows for programmatic configuration of the RTX subsystem

RTX 6.5.1 (no longer supported)

Key Features

- Supports the Intel Pentium M processor
Note: You can configure RTX to minimize the effects that power management features and other mobile specific features can have on RTX
- Supports PCI-X
- Supports local debugging within Microsoft Visual Studio .NET 2003
- RTX-supported C++ calls have been tested and documented
- NIC card support added to the Rt82543 driver for Intel Gigabit Ethernet controllers 82540, 82542, 82543, 82544, 82545, and 82546
- RTX Scheduler enhancement

RTX 6.1 (no longer supported)

Key Features

- Supports XP Service Pack 2
Note: XP SP2 also introduces Data Execution Prevention (DEP). DEP is not supported on dedicated multiprocessors.
- Supports Physical Address Extension (PAE)
- Supports Microsoft Visual Studio .NET 2003
 - Application wizard
 - C Runtime support
- RTX device wizard for Microsoft Visual Studio 6.0, .NET (2002), and .NET 2003

- Maximum number of sockets in RT-TCP/IP is configurable

RTX 6.0.1 (no longer supported)

Key Features

- Supports APIC Hal on uniprocessor systems
- Deterministic memory allocation
- Supports Microsoft Visual Studio .NET (2002)
 - Application wizard
 - C Runtime support
 - Local debugging in Microsoft Visual Studio

RTX 5.5 (no longer supported)

Key Features

- Runtime Features
 - High-resolution clocks and timers
 - TCP/IP stack IPv4
 - Floating Point support
 - Enhanced exception handling
 - Shutdown handlers
 - System starvation monitoring
 - Plug and Play resource support
 - Inter-process communication (IPC) mechanisms (events, mutexes, and semaphores)
 - Shared memory
- Supports Microsoft Visual Studio 6
 - Application wizard
 - C Runtime support

- Local debugging within Microsoft Visual Studio
- Tools and Utilities
 - TimeView – trace system events or custom user events
 - RTSS Object Viewer – view subsystem events
 - Platform Evaluator – evaluate system real-time capabilities
 - RTSS Task Manager – monitor real-time running processes
 - Properties Control Panel – configure RTX subsystem
- Add-on Features
 - RTX USB stack