

# RTX 2016 with Update 3

RUNTIME AND SDK INSTALL GUIDE

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Installation Guide for RTX 2016 with Update 3

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# Introduction

This guide describes system requirements and installation instructions for RTX 2016 with Update 3.

## Editions

IntervalZero provides six different Runtime editions of the RTX product, listed below.

<b>The edition...</b>	<b>Includes support for real-time operations on...</b>
Solo	One shared or dedicated RTSS processor in a uniprocessor or multicore/multiprocessor environment.
Entry	One shared or up to two dedicated RTSS processors in a multicore/multiprocessor environment.
Basic	One shared or up to three dedicated RTSS processors in a multicore/multiprocessor environment.
Professional	One shared or up to seven dedicated RTSS processors in a multicore/multiprocessor environment.
Premium	One shared or up to 15 dedicated RTSS processors in a multicore/multiprocessor environment.
Ultimate	One shared or up to 31 dedicated RTSS processors in a multicore/multiprocessor environment.

# 1

## Requirements

This chapter lists the hardware and software requirements for the RTX 2016 with Update 3 release.

### Hardware Requirements

#### HAL Type

To use the RTX Subsystem, your system must support one of the following HAL types:

<b>Windows Device Manager</b>	<b>Registry Resource Map</b>
Advanced Configuration and Power Interface (ACPI) PC	ACPI Compatible EISA/ISA HAL
ACPI Uniprocessor PC	ACPI 1.0 - APIC Platform UP
ACPI Multiprocessor PC	ACPI 1.0 - APIC Platform MP
ACPI x86-based PC	ACPI x86 Platform

#### Supported Network Adapters

The RTX release provides support for a number of network adapters. For the most up-to-date list, click the link titled Download the **RTX Supported Network Interface Cards** PDF file on this web site:

<http://www.intervalzero.com/support/useful-documentation>

#### Hardware Considerations

Some hardware configurations are not supported by RTX installations. When RTX can detect these unsupported configurations they are indicated with a popup error message.

Although RTX runs on most x86 platforms, unique attributes of some processors require special consideration before selecting them as a target system.

- For a comprehensive list of approved and supported hardware, see the Microsoft Windows Logo Program web page:

<http://www.microsoft.com/whdc/whql/default.msp>

- Problems with Microsoft WinDbg on AMD Opteron Dual-core AMD64 hardware

When using Windows versions prior to Windows Vista on AMD Opteron Dual-core AMD64 hardware, the system may exhibit unstable behavior. This behavior can be seen when trying to use Windows WinDbg to break into and step through Windows drivers due to incorrect context registers.

IntervalZero recommends using Windows 7 or Windows Vista as your base OS when using one of these AMD systems.

- On Dell Latitude D420 with Core Duo U2500 CPU systems, the RTSS subsystem will suffer a large decrease in performance if the following conditions exist:
  - Intel® SpeedStep® is enabled.
  - Prevent Windows idle state options are unchecked on the Hardware tab in the RTX Properties control panel.
  - Latency causing devices are not disabled.
- PCI express video controllers can cause jitter (large latencies) within an RTX application. Workarounds for this problem are to:
  - Select /BASEVIDEO in the boot.ini to use standard VGA display driver, or
  - Disable all DirectDraw and Direct3D acceleration in Display Control Panel. Click the Settings tab, then Advanced, then Troubleshoot.

- The NVIDIA GeForce 7300 LE video driver causes long latencies on Vista systems and should be disabled. The properties are:

**Driver file:** nvlddmkm.sys

**Driver version:** 7.15.10.9746

**Date:** 12.7.2006

This problem is also seen on Windows 7 systems which use both the NVIDIA GeForce 7300 LE card and the NVIDIA Quadro FX1700 card with properties (1220):

**Driver file:** nvlddmkm.sys

**Driver version:** 8.15.11.8593

**Date:** 05.14.2009

**NOTE:** If you disable this video driver using the RTX control panel, your display turns black and you must reboot. If you remove the driver using the Windows control panel, no reboot is required.

- On certain Dell dual-processor systems with the Intel® Xeon® chip sets (for example, Dell 650, Dell 670), the maximum timer delivery latency for a periodic RTX timer in Dedicated Mode is doubled under intensive video activities. Investigation results show that the high latency is inherited from the hardware.

# Software Requirements

## Operating System Requirements

The RTX 2016 with Update 3 Runtime and SDK are supported on the 32-bit configurations listed in the table below. The RTX 2016 with Update 3 SDK can be installed on a 64-bit Windows system, and that system can be used for development and to host the debugging of a target machine. However, you cannot install the Runtime Subsystem, as it is not supported on a 64-bit operating system.

### Runtime

	Uniprocessor PIC	Uniprocessor APIC	Multi-processor
<b>Windows 7 with SP1</b>	No	Yes	Yes
<b>Windows 7 with no SP</b>	No	Yes	Yes
<b>Windows Embedded Standard 7 with SP1</b>	No	Yes <sup>1</sup>	Yes <sup>1</sup>
<b>Windows Embedded Standard 7 with no SP</b>	No	Yes <sup>1</sup>	Yes <sup>1</sup>

<sup>1</sup>Windows Embedded Standard 7 system must support MSI installation to allow RTX to be installed.

### SDK

	Uniprocessor PIC	Uniprocessor APIC	Multi-processor
<b>Windows 10</b>	No	Yes	Yes
<b>Windows 8.1 with Update</b>	No	Yes <sup>1</sup>	Yes <sup>1</sup>
<b>Windows Embedded 8.1 with Update</b>	No	Yes <sup>1</sup>	Yes <sup>1</sup>
<b>Windows 7 with SP1</b>	No	Yes <sup>1</sup>	Yes <sup>1</sup>

<b>Windows 7 with no SP</b>	No	Yes <sup>1</sup>	Yes <sup>1</sup>
<b>Windows Embedded Standard 7 with SP1</b>	No	Yes <sup>2</sup>	Yes <sup>2</sup>
<b>Windows Embedded Standard 7 with no SP</b>	No	Yes <sup>2</sup>	Yes <sup>2</sup>
<b>Windows Vista with SP2</b>	No	Yes <sup>2</sup>	Yes <sup>2</sup>

<sup>1</sup>Supported on both 32-bit and 64-bit systems

<sup>2</sup>Windows Embedded Standard 7 system must support MSI installation to allow RTX to be installed.

For the most up-to-date list, click the link titled *Download the RTX Operating System Compatibility Matrix PDF* file on the web site <http://www.intervalzero.com/technical-support/guides-and-minitutorials/>.

**NOTE:** Windows Home editions are not supported.

## Retired Operating System Support

- Starting with RTX 2016, IntervalZero discontinued support for:
  - Windows XP Professional with SP3
  - Windows XP Embedded
  - Windows Server 2003 with SP1
  - Windows Server 2003 with no SP
  - Windows Server 2003 R2
  - Windows Server 2003 with SP2
  - Vista with SP1
  - Vista with no SP
  - Windows Embedded Standard 2009
- Starting with RTX 2009, IntervalZero discontinued RTX support for Windows 2000.

## .NET Framework

Microsoft .NET Framework 4 is required for RTX. You can download the .NET 4.0 standalone installer from <http://www.microsoft.com/en-us/download/details.aspx?id=17718>.

# Microsoft Visual Studio Requirements (SDK Only)

The RTX SDK requires that you have one of the following Microsoft Visual Studio versions installed if you wish to build or debug RTX programs with the Visual Studio IDE:

- Visual Studio 2015
- Visual Studio 2013

**NOTE:** Beginning with RTX 2011, IntervalZero has discontinued support for Visual Studio .NET 2003.

## Administrator Privileges

Administrator privileges are required for installing and uninstalling the RTX product. If you are installing on a system with User Account Control activated, your application will not be run with your full permissions unless you choose to run them as an administrator.

RTX provides local Windows Groups to control user access to RTX features. By default, all users are members of the **RTXAdministrators** and **RTXUsers** groups. These groups should be modified to only include necessary users. For more information, see [Users and Groups](#).

# 2

## Installing and Activating

This release is provided as a downloadable file from the IntervalZero Website. The installation program walks you through the installation process.

### Additional Installation Options

In addition to the installation described in this document, the RTX Runtime is also available in the following installation types:

- **Merge Modules for RTX Runtime Features** – The RTX Runtime components are available as merge modules that can be included in the installation of an OEM product. A separate installation places merge modules on the system for your use. The merge modules are also available as an Evaluation version.

### Before You Begin

Before beginning the installation, consider the following:

- A valid current boot configuration must be present on the system.
- Verify that your configuration meets the system requirements described earlier in this document.
- You must have administrator privileges on your system. Log on with administrator privileges or start the RTX installation using **Run as Administrator**.
- IntervalZero recommends that you de-select the Windows “Automatically reboot” option for Startup and Recovery from the Advanced tab of the System Properties page of the Windows Control Panel. De-selecting this parameter allows you to view blue screen information.
- Exit all Windows programs.

- RTX requires Microsoft .NET 4.0 to be installed on the system. If it is not already installed, you will be prompted during install to have RTX install it for you. You can download the .NET 4.0 standalone installer from:

<http://www.microsoft.com/en-us/download/details.aspx?id=17718>

**NOTE:** When installing RTX on a Windows 8 system, the installer may not detect whether .NET 4.0 is installed. In the event .NET 4.0 is not installed, you will need to install it manually.

- If you have installed the standalone RTX Virtual Network Add-On, and you want to upgrade, you must uninstall the standalone RTX Virtual Network Add-On **and reboot the system** before installing.
- For machines running a non-SP version of Windows 7, and on which .NET 4.5.1 is *not* installed, you must restart the machine after installing the RTX SDK.

**NOTE:** When you upgrade your operating system, you must uninstall and then reinstall RTX after the OS upgrade.

## Installation Warnings

Depending upon your system configuration, you may encounter installation warnings. The following warnings can occur yet still allow RTX to be installed successfully:

- "Setup was unable to interface with the power management service. Please note that an RTX-Compatible power configuration will not be created. See the RTX Installation Guide for detail on the RTX Recommended Power State."

If the power management feature is not a part of your Windows 7-Based Windows Embedded Standard 7 target image, then the installer will not be able to implement the RTX Recommended Power State. This should not affect functionality as the preferred power state for RTX is to have all power management features disabled.

- "Could not register type library for C:\Program Files\IntervalZero\RTX\tools\PlatformEvaluator\Cfx4032.ocx. Contact your support personnel."

On some Windows Embedded Standard systems, a warning could appear during installation noting that the ActiveX control used for Platform Evaluator could not be registered. This warning can be avoided by de-selecting the Platform Evaluator feature from the Custom Setup selections or it can be ignored if you do not intend to use the Platform Evaluator tool.

# Performing the Install

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## TO INSTALL:

1. Download the self-extracting executable, `RTX2016_with_Update_3_Setup.exe`, from the IntervalZero web site:

<https://www.intervalzero.com/rtx-2016-downloads/#tab-1>

**NOTE:** The download page also includes:

- The RTX Merge Module installer:

`RTX_2016_with_Update_3_MM.exe`

For access to evaluation kits, visit the Evaluation page at

<https://www.intervalzero.com/>.

In the form that appears, select RTX 2016 with Update 3 from the drop-down list, fill out the contact information, and click **Submit**.

2. Double-click the `RTX2016_with_Update_3_Setup.exe`.

**NOTE:** If Microsoft .NET 4.0 is not already installed on your machine, it will now be installed for you. Click Install to continue.

3. If necessary, click **Continue** in the User Account Control dialog box.

**NOTE:** If you are not a member of the Administrators group, this prompt requires you to enter the password for the Administrators account.

4. Click **Next** in the IntervalZero RTX installation Welcome window.
5. Read the End User License Agreement, select **I accept the terms in the license agreement** and then click **Next**.
6. Enter your user name, organization, and e-mail address, and then click **Next**.
7. Optionally, change to a destination other than the default:  
`C:\Program Files\IntervalZero\RTX`.  
Click **Next** in the Destination Folder screen.
8. In the Custom Setup screen, select the components and features you want to install, then click **Next**.

**NOTE:** If you select the Win32 Enabled Managed Code Support feature during installation, the Managed Code DLL will be registered by default.

**NOTE:** The Custom Setup screen only displays features in Visual Studio versions that are currently installed. If you install Visual Studio after installing RTX, you can add support for new functionality by changing the RTX installation through Add/Remove Programs.

9. In the Ready to Install the Program screen, select whether you want Desktop Icons and/or Start Menu Icons and then click **Install**.
10. If prompted, click **Install** to install the RTX Plug and Play driver.
11. Click **Finish** in the installation Completed screen.
12. Activate your product. See *Product Activation and Configuration* on the next page.

## Product Activation and Configuration

The Activation and Configuration dialog appears once RTX has been successfully installed. You must activate your RTX product and configure the boot configuration through this dialog.

**NOTE:**

When this symbol appears in the Activation and Configuration dialog, it indicates one of the following scenarios:



- The RTX Runtime component is installed and activated but not yet configured. To resolve this, configure system processors through the Configuration screen.
- A component was licensed by an Evaluation license which has since expired. To resolve this, purchase a full license for the RTX component(s) you want to use.

## Activating your Product

You can activate and lock your product to a specific machine or IntervalZero-provided dongle. The steps required to activate your product will depend on whether or not the machine is connected to the Internet.

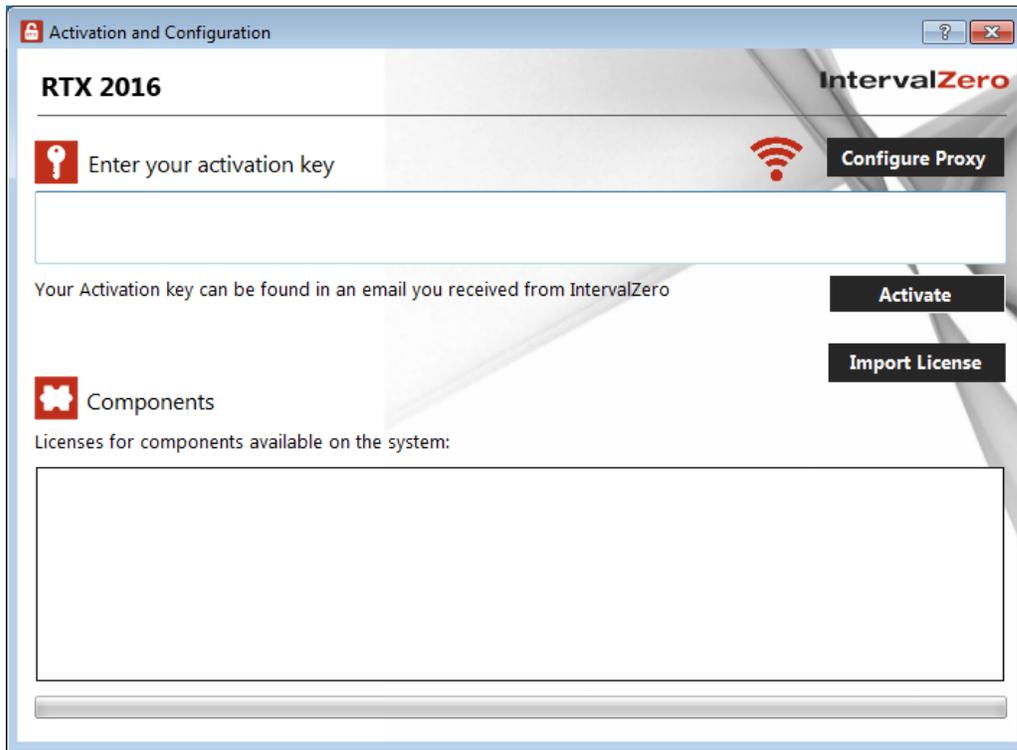
### Licensing your Product to a Machine

Follow the appropriate steps below to license RTX components to a specific machine.

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## TO ACTIVATE YOUR PRODUCT (INTERNET CONNECTION):

1. Open the **Activation and Configuration** dialog. This dialog appears once RTX has been installed. You can also launch it from **Start > All Programs > IntervalZero > RTX 2016 with Update 3 > Activation and Configuration**.



If you have a dongle connected to the machine, click the dongle icon to turn off the dongle.

**Icon:**



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**Status:** Dongle recognized but turned off

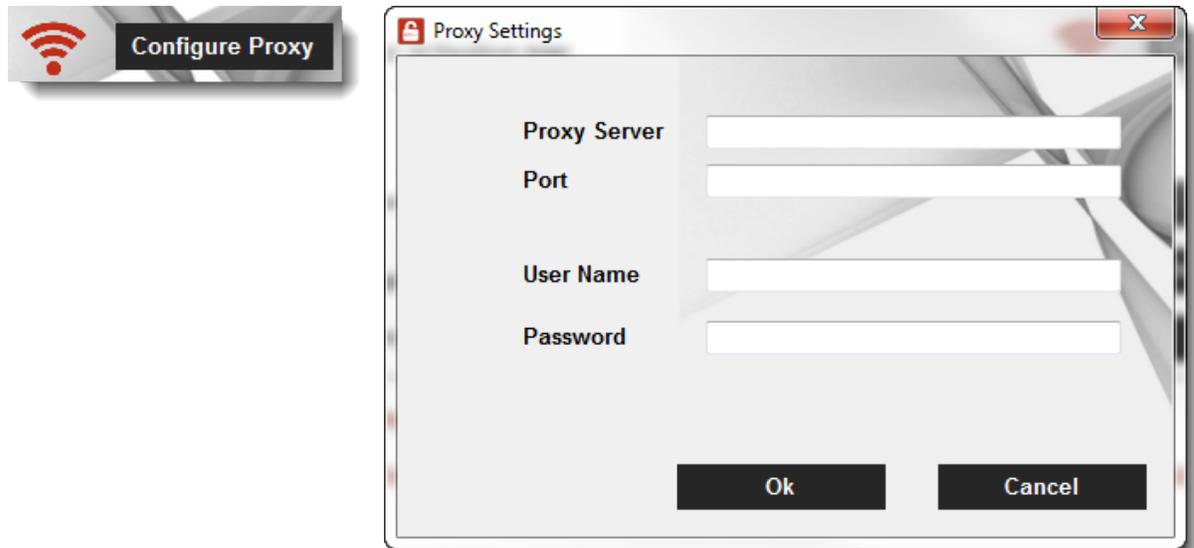
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**Result:** Locks RTX component(s) to the machine

2. Make sure your machine is connected to the Internet with access to the IntervalZero License Server.

<b>Icon:</b>		
<b>Status:</b>	Network Connection	No Network Connection
<b>Result:</b>	Continue with activation	Configure a Proxy Server

If no network connection is found, make sure all network cables are plugged in and that the firewall allows access, and click the Network icon to refresh. If a network connection still isn't found, you may need to configure a Proxy Server. To do this, click the **Configure Proxy** button and provide the requested settings:



This information should be available from your IT department.

**NOTE:** The proxy server must be able to proxy HTTP connections. SOCKS proxies are not supported.

**NOTE:** If no network connection can be established, skip to *To activate your product (no Internet connection)*.

3. Enter your activation key and then click **Activate**. The product components activated by your key are indicated by a check mark in the Components box. Note that the RT-TCP/IP Stack requires a separate license.

**NOTE:** You can find your activation key in the email you received from IntervalZero Sales.

4. Click **Configure** to configure system processors. See [Configuring your System](#) below for more information.

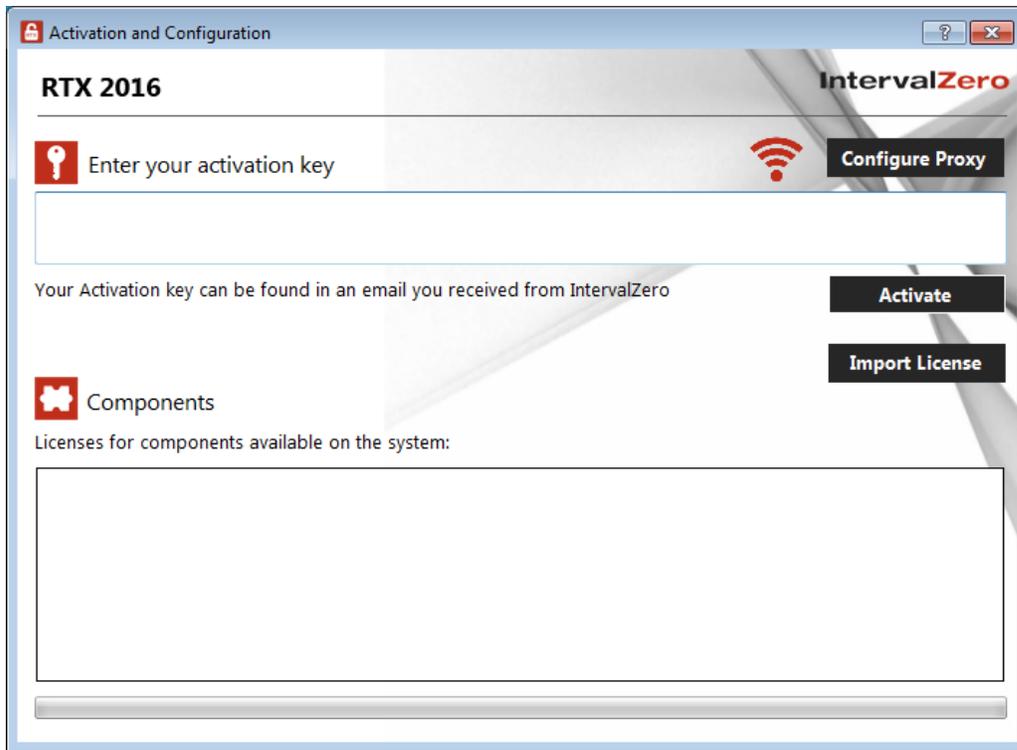
**IMPORTANT!** You must configure the RTX Subsystem before you can use RTX.

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## TO ACTIVATE YOUR PRODUCT (NO INTERNET CONNECTION):

If the computer on which you installed RTX is *not* connected to the Internet, the activation process requires a few additional steps.

1. Open the **Activation and Configuration** dialog. This dialog appears once RTX has been installed. You can also launch it from **Start > All Programs > IntervalZero > RTX 2016 with Update 3 > Activation and Configuration**.



If you have a dongle connected to the machine, click the dongle icon to turn off the dongle.

**Icon:**



---

**Status:** Dongle recognized but turned off

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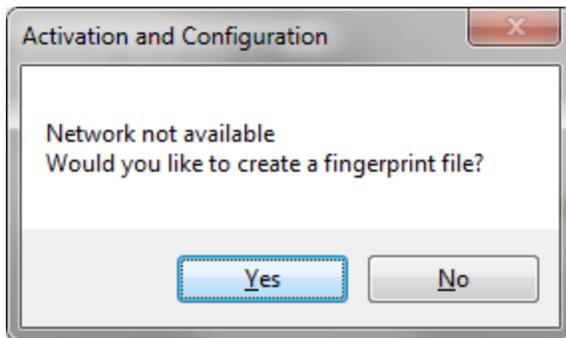
**Result:** Locks RTX component(s) to the machine

2. Check your Internet connection. Continue with these steps only if there is no connection to the Internet. If you are connected, follow the steps in the previous section:
3. Enter your activation key and then click **Activate**.

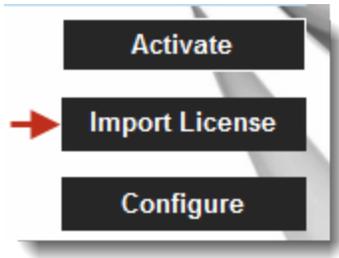
**NOTE:** You can find your activation key in the email you received from IntervalZero Sales.

**NOTE:** If you enter an invalid activation key, you will not know until you attempt to generate a license file in Step 11.

4. In the dialog that appears, click **Yes** to create a fingerprint file.



5. In the **Save As** dialog, name the file `fingerprint.rfp`. By default, the file will be saved to the desktop.
6. Navigate to the desktop, and then copy and paste the file `fingerprint.rfp` to an external device.
7. Connect the device to a machine with Internet connectivity.
8. Launch a web browser, and navigate to <http://Activation.IntervalZero.com>.
9. Browse for and open the file `fingerprint.rfp`.
10. Read and agree with the **Terms & Conditions**.
11. Click **Activate** to generate a license (`.lic`) file.
12. In the File Download dialog, click **Save**.
13. Copy the file `License.lic` to the external device, and transfer it to the machine on which RTX is installed.
14. In the Product Activation dialog, click **Import License**.



15. Browse for and open the file `License.lic`.
16. Click **Configure** to configure system processors. See [Configuring Your System](#) below for more information.

**IMPORTANT!** You must configure the RTX Subsystem before you can use RTX.

## Licensing your Product to a Dongle

Follow the appropriate steps below to license RTX components to an IntervalZero-provided dongle. Dongles are available in two sizes:

	Small Form Factor	Standard
<b>Supported RTX Versions</b>	RTX 2016	All
<b>Holds a copy of the license file</b>	Yes	No

If you have a dongle that has already been activated for the components you have installed, skip to section [To use a dongle that has already been activated](#).

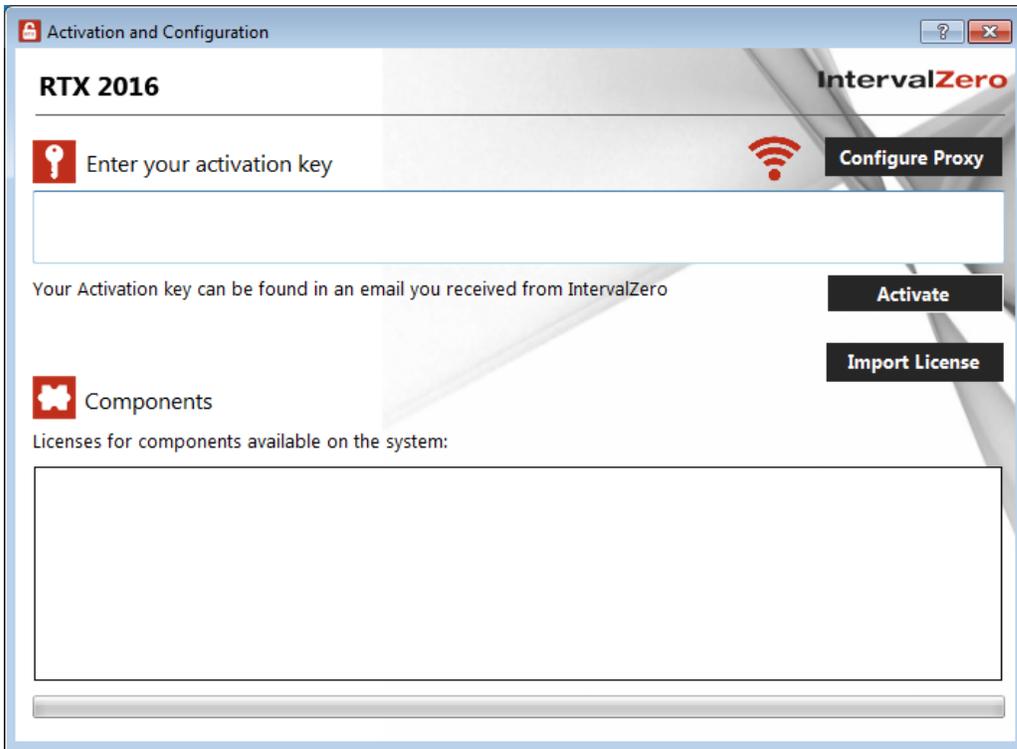
**NOTE:** You can also license RTX components to an IntervalZero-provided dongle using the Dongle Activation Utility. The IntervalZero-provided Dongle Activation Utility can be used to pre-activate licensed components on machines where RTX is not installed. You can download the Dongle Activation Utility from the IntervalZero website at <http://www.intervalzero.com/rtx-downloads/tools-utilities/>.

**IMPORTANT!** You cannot license RTX components to a dongle when more than one dongle is connected to the machine.

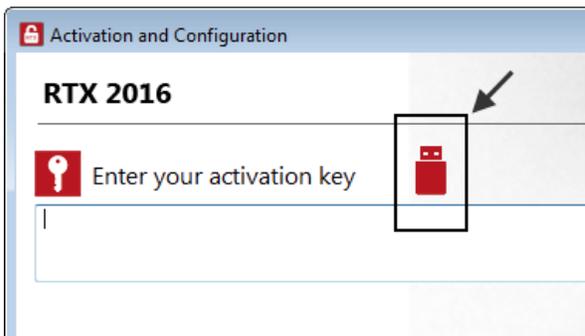
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### TO ACTIVATE YOUR PRODUCT (INTERNET CONNECTION):

1. Open the **Activation and Configuration** dialog. This dialog appears once RTX has been installed. You can also launch it from **Start > All Programs > IntervalZero > RTX 2016 with Update 3 > Activation and Configuration**.



2. Connect the IntervalZero-provided dongle to the machine now. When a dongle is connected to the machine, a dongle icon appears in the **Activation and Configuration** dialog.



<b>Icon:</b>			
<b>Status:</b>	Dongle recognized and available	Dongle is connected but turned off. Click the icon to enable the dongle.	Multiple dongles detected
<b>Result:</b>	Locks RTX component(s) to the dongle	Locks RTX component(s) to the machine	You cannot license RTX components to a dongle when more than one dongle is connected to the machine.

**IMPORTANT!** Once components are locked to a dongle, the dongle must be connected in order to use RTX components on that machine.

3. Make sure your machine is connected to the Internet with access to the IntervalZero License Server.

<b>Icon:</b>		
<b>Status:</b>	Network Connection	No Network Connection
<b>Result:</b>	Continue with activation	Configure a Proxy Server

If no network connection is found, make sure all network cables are plugged in and that the firewall allows access, and click the Network icon to refresh. If a network connection still isn't found, you may need to configure a Proxy Server. To do this, click the **Configure Proxy** button and provide the requested settings:

A dialog box titled "Proxy Settings" with a close button (X) in the top right corner. It contains four input fields: "Proxy Server", "Port", "User Name", and "Password". At the bottom, there are two buttons: "Ok" and "Cancel".

This information should be available from your IT department.

**NOTE:** The proxy server must be able to proxy HTTP connections. SOCKS proxies are not supported.

**NOTE:** If no network connection can be established, skip to *To activate your product (no Internet connection)*.

4. Enter your activation key and then click **Activate**. The product components activated by your key are indicated by a check mark in the Components box. Note that the RT-TCP/IP Stack requires a separate license.

**NOTE:** You can find your activation key in the email you received from IntervalZero Sales.

5. Click **Configure** to configure system processors. See [Configuring your System](#) below for more information.

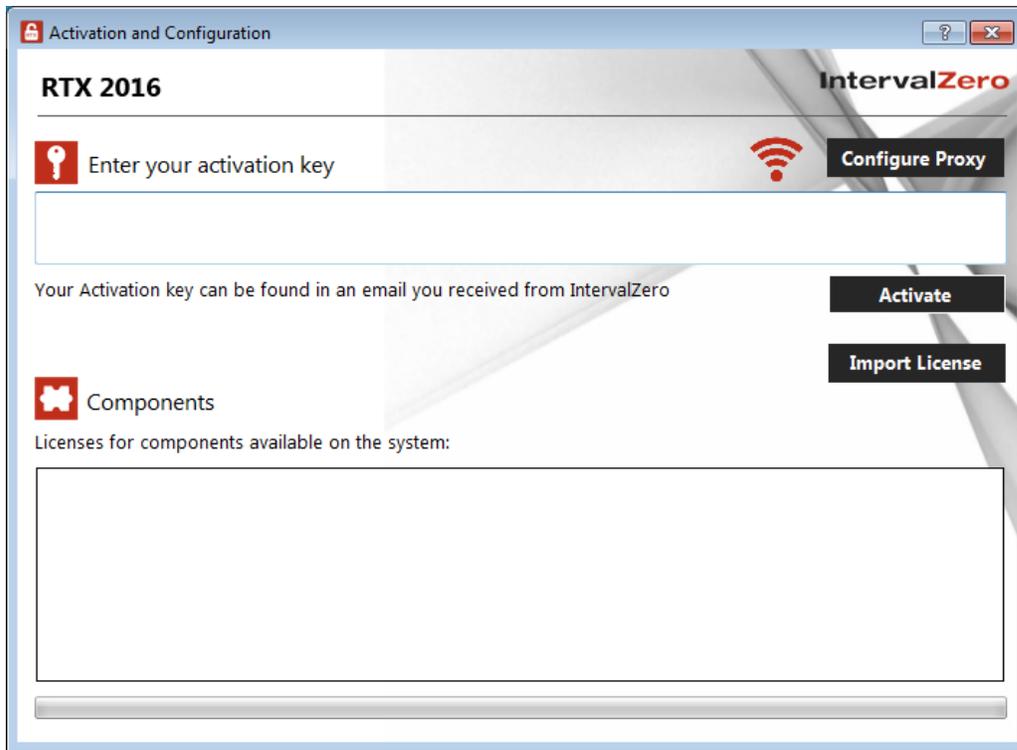
**IMPORTANT!** You must configure the RTX Subsystem before you can use RTX.

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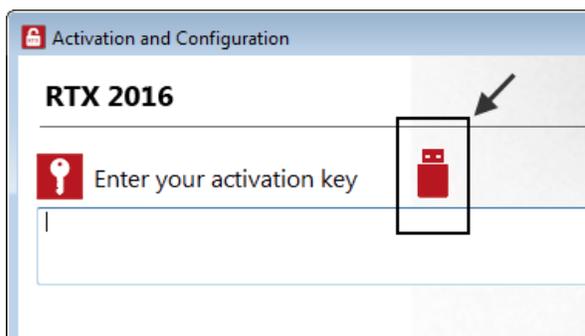
## TO ACTIVATE YOUR PRODUCT (NO INTERNET CONNECTION):

If the computer on which you installed RTX is *not* connected to the Internet, the activation process requires a few additional steps.

1. Open the **Activation and Configuration** dialog. This dialog appears once RTX has been installed. You can also launch it from **Start > All Programs > IntervalZero RTX 2016 with Update 3 > Activation and Configuration**.



2. Connect the IntervalZero-provided dongle to the machine now. When a dongle is connected to the machine, a dongle icon appears in the **Activation and Configuration** dialog.



<b>Icon:</b>			
<b>Status:</b>	Dongle recognized and available	Dongle is connected but turned off. Click the icon to enable the dongle.	Multiple dongles detected
<b>Result:</b>	Locks RTX component(s) to the dongle	Locks RTX component(s) to the machine	You cannot license RTX components to a dongle when more than one dongle is connected to the machine.

**IMPORTANT!** Once components are locked to a dongle, the dongle must be connected in order to use RTX components on that machine.

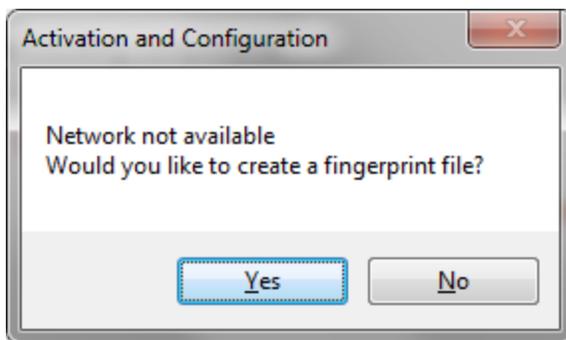
3. Check your Internet connection. Continue with these steps only if there is no connection to the Internet. If you are connected, follow the steps in the previous section:

4. Enter your activation key and then click **Activate**.

**NOTE:** You can find your activation key in the email you received from IntervalZero Sales.

**NOTE:** If you enter an invalid activation key, you will not know until you attempt to generate a license file in Step 12.

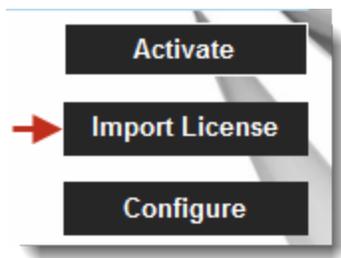
5. In the dialog that appears, click **Yes** to create a fingerprint file.



6. In the **Save As** dialog, name the file `fingerprint.rfp`. By default, the file will be saved to the desktop.

7. Navigate to the desktop, and then copy and paste the file `fingerprint.rfp` to an external device.

8. Connect the device to a machine with Internet connectivity.
9. Launch a web browser, and navigate to <http://Activation.IntervalZero.com>.
10. Browse for and open the file `fingerprint.rfp`.
11. Read and agree with the **Terms & Conditions**.
12. Click **Activate** to generate a license (`.lic`) file.
13. In the File Download dialog, click **Save**.
14. Copy the file `License.lic` to the external device, and transfer it to the machine on which RTX is installed.
15. In the Product Activation dialog, click **Import License**.



16. Browse for and open the file `License.lic`.
17. Click **Configure** to configure system processors. See [Configuring your System](#) below for more information.

**IMPORTANT!** You must configure the RTX Subsystem before you can use RTX.

---

#### TO USE A DONGLE THAT HAS BEEN PRE-ACTIVATED:

If the dongle you have received has already been pre-activated, you only need to:

##### **Small Form Factor**

##### **Standard**

Plug in the dongle (the license file is already on the dongle)

Import the license file

1. Connect the IntervalZero-provided dongle to a USB port on the machine.
2. Open the **Activation and Configuration** dialog. This dialog appears once RTX has been installed. You can also launch it from **Start > All Programs > IntervalZero > RTX 2016 with Update 3 > Activation and Configuration**.
3. Make sure the Activation and Configuration utility recognizes the dongle:

**Icon:**



---

**Status:** Dongle recognized and available

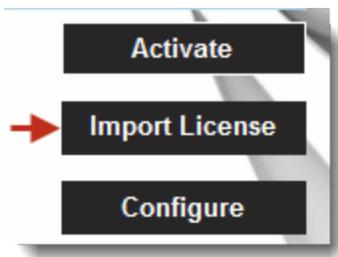
---

**Result:** Locks RTX component(s) to the dongle

If the dongle is not recognized, make sure it is securely connected to your machine. Proceed once you see the Dongle Active icon.

**Steps 4-5 are for Standard dongles only:**

4. In the Product Activation dialog, click **Import License**.



5. Browse for and open the file `License.lic` you received with the activated dongle.

**NOTE:** The license is locked to the dongle. The dongle must be connected to the machine in order to use RTX components.

6. Click **Configure** to configure system processors.

**NOTE:** You must configure the RTX Subsystem before you can use RTX.

# Configuring your System

Through the Configure screen, you can assign available processors to Windows or RTX. The configuration routine automatically detects the total number of processors on your system.

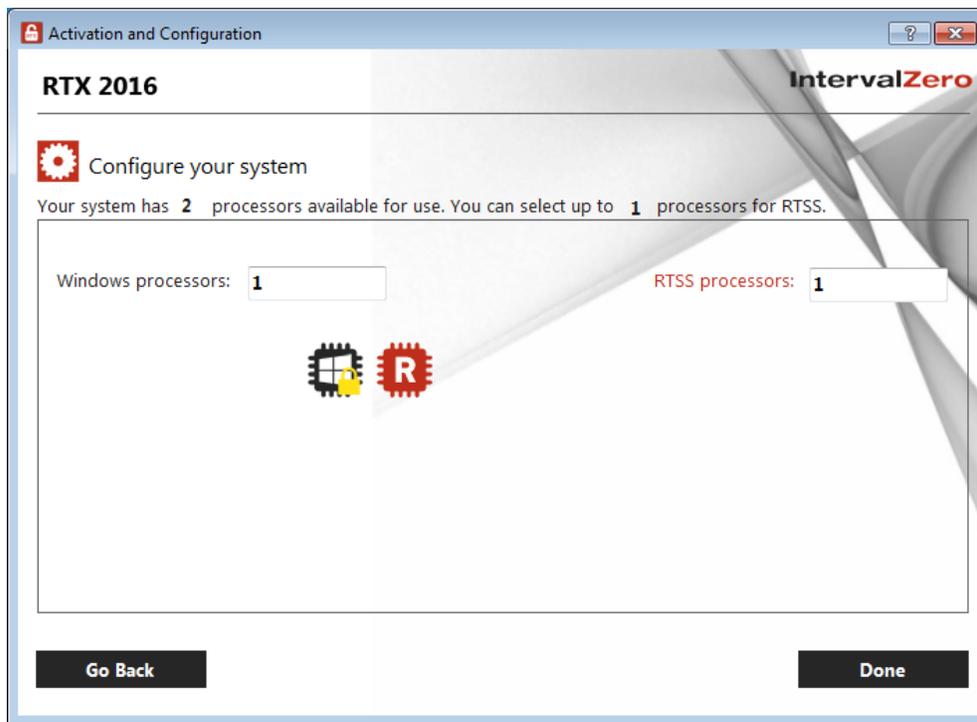
**NOTE:** If your system is hyper-threaded, it is recommended that you assign an even number of processors between Windows and RTX. The Windows logical processor and RTSS logical processor must not share the same physical processor.

---

## TO ASSIGN PROCESSORS:

1. In the Activation and Configuration dialog, click **Configure** to configure system processors. You can assign processors between Windows and RTX. There must be at least one Windows processor (indicated by the lock). Based on the edition purchased, you will have a maximum number of processors that can be used for RTX, as shown in the text of the dialog.

**NOTE:** Any processors not associated with either Windows or RTX will be disabled and unavailable for use.



2. Click **Done** to complete configuration.
3. When you are prompted, click **Yes** to restart your computer.

**NOTE:** On Windows 8.1, configuration changes will only take effect following a restart, not a shutdown.

4. Choose the RTX boot configuration at system startup:

- Windows 8.1: **Windows 8.1 - RTX**
- Windows 7: **Windows 7 - RTX**

**NOTE:** The RTX control panel will not provide completely accurate information until you reboot your system.

**NOTE:** Even if you don't restart immediately, all changes will be saved and will take effect after the next restart.

## Verifying the Installation

After RTX has been installed and licensed, you can run the System Response Time Measurement (SRTM) utility to verify that the Subsystem installation was successful.

---

TO RUN SRTM:

1. Open Windows Explorer and navigate to the <RTXDIR>\bin directory.

**NOTE:** If you accepted the installation defaults, this location is:

```
C:\Program Files\IntervalZero\RTX\bin
```

2. Run SRTM by double-clicking the `srtm.rtss` executable.

You should hear a steady 1 KHz tone for 15 seconds and a histogram of the system's response time measurements should appear on the screen.

### SAMPLE OUTPUT FROM SRTM.RTSS

---

```
SRTM v2.0 timer delivery latencies for a periodic RTX timer:
```

```
Timer Period = 100 us, Clock Resolution = 0.1 us.
```

```
Sample Period = 15 s, Total Ticks = 149999.
```

```
Summary:
```

```
Minimum = 0 us, Average = 0 us, Maximum = 3 us
```

Histogram:

```
0 - 1 us: 29607
1 - 2 us: 375
2 - 3 us: 16
3 - 4 us: 1
4 - 1000 us: 0 ***
```

## Viewing the Release Notes after Installation

Each component has release notes installed as part of its product and can be accessed by selecting **IntervalZero > RTX 2016 with Update 3 > RTX Documentation** and then **Release Notes** from the Start menu.

## Users and Groups

Once RTX has been successfully installed, all authenticated users who log on to the system can control, configure, and run the RTX Subsystem and RTSS applications, even if they are not computer or domain administrators. System administrators can control access to the RTX resources by configuring members of the **RTXAdministrators** and **RTXUsers** groups:

- RTXAdministrators have *full* access to all RTX resources, including the ability to debug RTSS applications.
- RTXUsers have *read* access to all RTX resources. They cannot start the RTX Subsystem, but they can perform the following operations:
  - Execute RTSS applications (if the Subsystem was started by a Windows Administrator, or a member of one of the other RTX groups)
  - Terminate RTSS processes
  - Register and unregister RTDLLs
  - Register boot-time applications
  - Examine product configuration state
  - Enumerate and examine subsystem objects via the Object Viewer

**NOTE:** Elevated Administrator accounts will always have the same rights as members of the RTXAdministrators group.

**NOTE:** When you make a change to any of the three RTX groups above, you must log out/in for the change to take effect.

**NOTE:** Certain settings in the RTX Properties control panel will be grayed out if the user does not have Windows Administrator privileges.

Note that when RTX is first installed, each of these groups includes all users for ease of use:

- The Windows group **Authenticated Users**
- The Windows user **SYSTEM** (also known as LocalSystem).

**IMPORTANT!** The Windows user SYSTEM must never be removed from any of the RTX groups.

When modifying RTX groups, remove Authenticated Users from the RTX group first, then add individual users based on their usage needs.

# 3

## Uninstalling

### Uninstall Considerations

Keep the following in mind when removing RTX from your system.

- When RTX is uninstalled from a system, any devices given to RTX must be returned to Windows by using the Windows Device Manager.
- The RTX Properties control panel must be closed before uninstalling RTX.
- An error message appears if you do not allow the RTX subsystem to be stopped automatically during an uninstall.

### Performing the Uninstall

If you need to uninstall any of the RTX components, perform the appropriate procedure, as described below, for your version of Windows.

---

#### TO UNINSTALL RTX:

1. From the *Start* menu, choose **Control Panel**.
2. Under *Programs*, click **Uninstall a Program**.
3. Select RTX 2016 with Update 3 and then click **Uninstall**.

**NOTE:** If the RTX subsystem is currently running, the uninstall process tells you that the subsystem must be stopped in order to uninstall RTX. If the process asks if you want to stop the subsystem and then continue, click **Yes**.

4. Click **Yes** to confirm.
5. If necessary, click **Allow**.

6. You are warned if any RTX applications need to be stopped prior to uninstalling. Verify that **Automatically close applications and attempt to restart them after setup is complete** is selected and click **OK**.

# Appendix A:

## System Modifications During Installation

The RTX installation process performs system modifications. This section describes the modifications that are made and why they are necessary.

### RTX-Recommended Power State / Power Plans on Machines

RTX does not support Windows 7 hibernation or hybrid sleep. These features must be disabled to provide real-time performance. To facilitate this process, the RTX installer creates and enables a new power state on your machine ("RTX-Recommended") with the proper settings. See the next two topics for details.

During an uninstall, the RTX installer reactivates the original power state and deletes the RTX-Recommended state.

#### RTX-Recommended Basic Settings

When using RTX it is recommended that power management is set such that the display/monitor is never turned off and the computer is never put to sleep/hibernate.

#### RTX-Recommended Advanced Settings

Category	Settings
Hard disk	Turn off hard disk after = Never
Sleep	Sleep After = Never Allow hybrid sleep = Off Hibernate after = Never
PCI Express	Link State Power Management = Off

<b>Category</b>	<b>Settings</b>
<b>Processor power management</b>	Minimum processor state = 100% Maximum processor state = 100%

On laptops, both AC and DC behaviors are set for all of the RTX-Recommended Basic and RTX-Recommended Advanced settings.

---

#### TO VIEW A POWER STATE'S SETTINGS:

1. From the *Start* menu, choose **Control Panel**.
2. Click **Hardware and Sound** and then click **Power Options**.
3. View the settings for the power scheme you will be using and change if necessary.
4. View and, if necessary, change advanced power settings.

# Getting Support

IntervalZero offers a number of support options for RTX users, including technical support and the IntervalZero Website.

## Third-Party Support

If you are a customer who purchased an IntervalZero product through a third-party reseller, contact the reseller for support.

## Contacting Technical Support by Phone

For technical support related to installing and using RTX, you can call 1-781-996-4481. At the prompt, press 3 for Support.

Hours are Monday - Friday, 8:30 a.m. – 5:30 p.m. US Eastern time (GMT-500), excluding holidays.

## Before Calling Technical Support

Please have the following information ready before calling IntervalZero Technical Support:

### Your Support ID

Customers who purchase direct support receive an e-mail address and password for use when accessing the IntervalZero support Website.

### The Version Number of Your RTX Software

Before calling technical support, determine the version of RTX installed on your system.

To obtain the RTX version number:

1. Click **Start > All Programs > IntervalZero > RTX 2016 with Update 3 > RTX Properties**.
2. Record the RTX version that is shown in the RTX Properties window.

Also, check to make sure you have a valid maintenance contract.

## IntervalZero Website

The IntervalZero Customer Support Web page is located at:

<http://www.intervalzero.com/technical-support/>

The IntervalZero support web pages provide electronic access to the latest product releases, documentation, and release notes. With a valid e-mail address and password, you can access the online problem report database to submit new issues or to obtain the status of previously reported issues.

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