

# **RTI Queuing Service**

## **Getting Started Guide**

**Version 6.0.0**



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# Chapter 1 Welcome to RTI Queuing Service

*RTI® Queuing Service* is a broker that provides a queuing communication model in which a sample is stored in a queue until it is consumed by one *QueueConsumer*. If there are no *QueueConsumer*s available when the sample is sent, the sample is kept in the queue until a *QueueConsumer* is available to process it. If a *QueueConsumer* receives a sample and does not acknowledge it before a specified amount of time or acknowledges it negatively, the sample will be redelivered to a different *QueueConsumer*.

*Queuing Service* provides an “at-most-once” and “at-least once” delivery semantic.

By default, *Queuing Service* keeps the samples in memory. To provide fault tolerance, *Queuing Service* can be configured to keep the samples on disk.

For high availability, *Queuing Service* provides mechanisms to replicate its state so that samples can survive the loss of any particular service and/or computer.

## 1.1 Paths Mentioned in Documentation

The documentation refers to:

- **<NDDSHOME>**

This refers to the installation directory for *RTI® Connex® DDS*. The default installation paths are:

- Mac® OS X® systems:  
**/Applications/rti\_connex\_dds-6.0.0**
- UNIX-based systems, non-*root* user:  
**/home/<your user name>/rti\_connex\_dds-6.0.0**
- UNIX-based systems, *root* user:  
**/opt/rti\_connex\_dds-6.0.0**

- Windows® systems, user without Administrator privileges:  
**<your home directory>\rti\_connexdds-6.0.0**
- Windows systems, user with Administrator privileges:  
**C:\Program Files\rti\_connexdds-6.0.0**

You may also see \$NDDSHOME or %NDDSHOME%, which refers to an environment variable set to the installation path.

Wherever you see <NDDSHOME> used in a path, replace it with your installation path.

**Note for Windows Users:** When using a command prompt to enter a command that includes the path **C:\Program Files** (or any directory name that has a space), enclose the path in quotation marks. For example:

```
"C:\Program Files\rti_connexdds-6.0.0\bin\rtiddsgen"
```

Or if you have defined the NDDSHOME environment variable:

```
"%NDDSHOME%\bin\rtiddsgen"
```

- **<path to examples>**

By default, examples are copied into your home directory the first time you run *RTI Launcher* or any script in <NDDSHOME>/bin. This document refers to the location of the copied examples as <path to examples>.

Wherever you see <path to examples>, replace it with the appropriate path.

Default path to the examples:

- Mac OS X systems: /Users/<your user name>/rti\_workspace/6.0.0/examples
- UNIX-based systems: /home/<your user name>/rti\_workspace/6.0.0/examples
- Windows systems: <your Windows documents folder>\rti\_workspace\6.0.0\examples

Where 'your Windows documents folder' depends on your version of Windows. For example, on Windows 10, the folder is C:\Users\<your user name>\Documents.

Note: You can specify a different location for **rti\_workspace**. You can also specify that you do not want the examples copied to the workspace. For details, see *Controlling Location for RTI Workspace and Copying of Examples* in the *RTI ConnexDDS Core Libraries Getting Started Guide*.

# Chapter 2 Installing Queuing Service

This chapter describes:

- [2.1 Installing on a UNIX-Based System below](#)
- [2.2 Installing on a Windows System on the next page](#)

## 2.1 Installing on a UNIX-Based System

Install *Queuing Service* on top of *Connex DDS*. There are two ways to install it, from *RTI Launcher* or from the command line.

### From *RTI Launcher*:

1. Start *RTI Launcher* from the command line:

```
cd <NDDSHOME>/bin  
./rtilauncher
```

<NDDSHOME> is described in [1.1 Paths Mentioned in Documentation on page 1](#).

2. From the **Configuration** tab, select **Install RTI Packages**.
3. In the resulting dialog, use the + sign to add the **.rtipkg** file that you want to install.
4. Click **Install**.

### From the command line:

```
cd <NDDSHOME>/bin  
./rtipkginstall <path to .rtipkg file>
```

If you want to install *Queuing Service* without user interaction (unattended mode), use the **-u** flag when installing from the command line:

```
cd <NDDSHOME>/bin  
./rtipkginstall -u <path to .rtipkg file>
```

*Queuing Service* will be installed in the <NDDSHOME> directory (see [1.1 Paths Mentioned in Documentation on page 1](#)).

## 2.2 Installing on a Windows System

Install *Queuing Service* on top of *Connex DDS*. There are two ways to install it, from *RTI Launcher* or from the command line.

### From *RTI Launcher*:

1. Start *RTI Launcher* from the Start menu or the command line:

```
cd <NDDSHOME>\bin
rtilauncher
```

<NDDSHOME> is described in [1.1 Paths Mentioned in Documentation on page 1](#).

2. From the **Configuration** tab, select **Install RTI Packages**.
3. In the resulting dialog, use the + sign to add the **.rtipkg** file that you want to install.
4. Click **Install**.

### From the command line:

```
cd <NDDSHOME>\bin
rtipkginstall <path to .rtipkg file>
```

If you want to install *Queuing Service* without user interaction (unattended mode), use the **-u** flag when installing from the command line:

```
cd <NDDSHOME>/bin
./rtipkginstall -u <path to .rtipkg file>
```

*Queuing Service* will be installed in the <NDDSHOME> directory (see [1.1 Paths Mentioned in Documentation on page 1](#)).

# Chapter 3 Using the Examples

*Queuing Service* includes two examples to show its most relevant functionality:

- **hello\_world**: A Hello World application, in which is shown how to send/receive samples from/to *Queuing Service*. The example also shows how to use other relevant features such as persistence and replication.
- **remote\_config**: A Remote Configuration example, in which is shown how to remotely create/delete resources, query their status, get a message, or flushing SharedReaderQueues. This example uses the Request/Reply API.

The examples are in <path to examples>/queuing\_service/<language>, where <path to examples> is described in [1.1 Paths Mentioned in Documentation on page 1](#) and <language> is c++ for C++ or cs for .NET. There are some differences between the versions:

- The .NET **hello\_world** example uses the *Queuing Service* wrapper API, while the C++ example uses *DataWriters* and *DataReaders* directly to interact with *Queuing Service*, since the wrapper API is not available for C++.
- The .NET **hello\_world** example uses two SharedReaderQueues: a request and a reply SharedReaderQueue. The C++ example only uses a request SharedReaderQueue.
- The .NET **hello\_world** example is also a performance test, measuring requests and replies per second, The C++ version sends one message per second.

By default, the .NET **hello\_world** example's SharedReaderQueues use different types than the C++ example.

Because of these differences, you will need to make some modifications in the examples in order for a **hello\_world** C++ Producer to interoperate with a **hello\_world** .NET Replier, and vice-versa.

To run the examples, please follow the instructions in the **README.txt** file included in the example's directory.



# Chapter 4 Running Queuing Service

*Queuing Service* runs as a separate application. The script to run the executable is in `<NDDSHOME>/bin`. There are four ways to start *Queuing Service*:

- [4.1 Starting from Launcher below](#)
- [4.2 Starting Manually from the Command Line on the next page](#)
- [4.3 Using Queuing Service as a Windows Service on page 9](#)

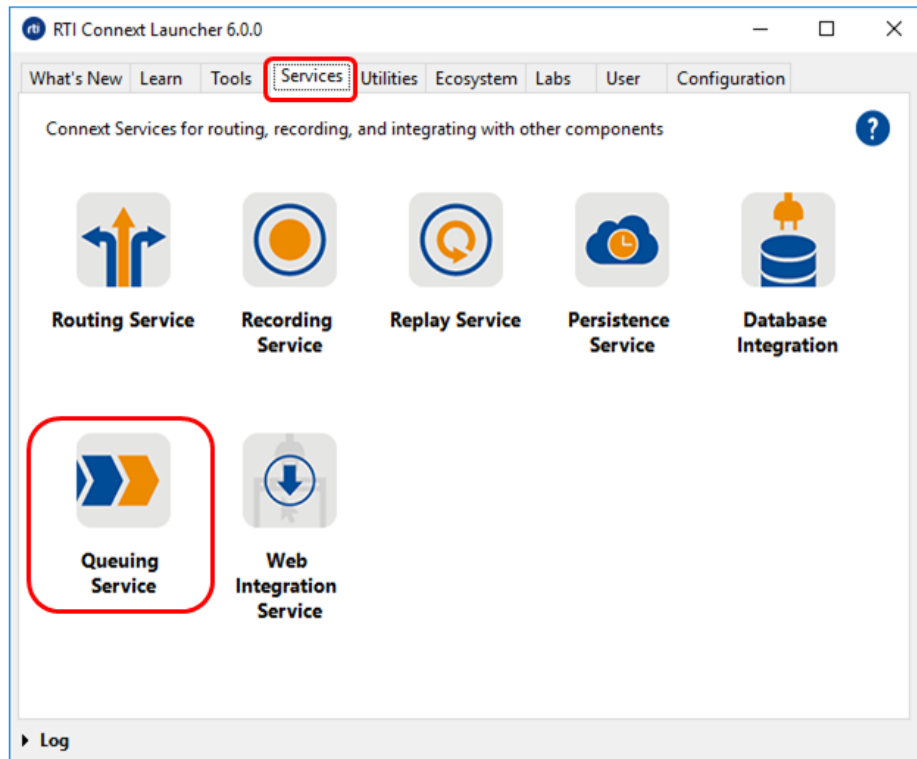
If you are starting *Queuing Service* as a Windows Service, also read [4.3.3 Notes when Running as a Windows Service on page 10](#).

## 4.1 Starting from Launcher

1. Start *RTI Launcher* from the Start menu (on Windows systems) or on the command line, type:

```
<NDDSHOME>/bin/rtilauncher
```

2. From the **Services** tab, select **Queuing Service**.



## 4.2 Starting Manually from the Command Line

To start **Queuing Service**, enter:

```
cd <NDDSHOME>
bin/rtiqueuingervice [options]
```

**Example:**

```
cd <NDDSHOME>
bin/rtiqueuingervice -cfgFile example.xml -cfgName QueuingService_1
```

[Table 4.1 RTI Queuing Service Command-Line Options](#) describes the command-line options.

**Table 4.1 RTI Queuing Service Command-Line Options**

Option	Description
<code>-appName &lt;name&gt;</code>	<p>Assigns a name to the execution of <i>Queuing Service</i>.</p> <p>Remote commands will refer to the queuing service using this name.</p> <p>In addition, the name of <i>DomainParticipants</i> created by <i>Queuing Service</i> will be based on this name.</p> <p>Default: The name given with <code>-cfgName</code>, if present, otherwise it is <code>RTI_Queueing_Service</code>.</p>

Table 4.1 RTI Queuing Service Command-Line Options

Option	Description
<code>-cfgFile &lt;name&gt;</code>	<p>Specifies a configuration file to be loaded.</p> <p>This parameter is required.</p> <p>See Section 3.1 How to Load the XML Configuration from a File in the <i>Queuing Service User's Manual</i>.</p>
<code>-cfgName &lt;name&gt;</code>	<p>Specifies a configuration name. <i>Queuing Service</i> will look for a matching <code>&lt;queuing_service&gt;</code> tag in the configuration file.</p> <p><b>This parameter is required unless <code>-cfgRemote</code> is used.</b></p>
<code>-cfgRemote</code>	<p>Specifies that the initial configuration of the service must be obtained remotely from other running instances.</p> <p>Using this option also requires the use of <code>-remoteAdministrationDomainId</code> to enable remote administration, because the initial configuration will be received in the remote administration domain ID.</p> <p>If you use this option and <code>-cfgName</code>, the service will wait until a configuration with that name is received. Otherwise, the service will use the first configuration that it receives.</p> <p>If the service does not receive the initial configuration after a configurable timeout (see <code>-cfgRemoteTimeout</code>), it will load the configuration from the input configuration file(s).</p>
<code>-cfgRemoteTimeout &lt;n&gt;</code>	<p>Specifies the maximum amount of time, in seconds, that <i>Queuing Service</i> will wait for an initial configuration when using <code>-cfgRemote</code>.</p> <p>Default: 20 seconds</p>
<code>-daemon</code>	<p>Runs <i>Queuing Service</i> as a daemon/Windows service. When this flag is present, <i>Queuing Service</i> will start in the background. Note that some systems may require special privileges to do this.</p>
<code>-domainIdBase &lt;ID&gt;</code>	<p>Sets the base domain ID.</p> <p>This value is added to the domain IDs in the configuration file. For example, if you set <code>-domainIdBase</code> to 50 and use domainIDs 0 and 1 in the configuration file, then <i>Queuing Service</i> will use domains 50 and 51.</p> <p>Default: 0</p>
<code>-heapSnapshotPeriod</code>	<p>Enables heap monitoring.</p> <p><i>Queuing Service</i> will generate a heap snapshot every <code>&lt;sec&gt;</code>.</p> <p>Default: heap monitoring is disabled.</p>
<code>-heapSnapshotDir</code>	<p>When heap monitoring is enabled, this parameter configures the directory where the snapshots will be stored. The snapshot filename format is <code>RTI_&lt;configurationName&gt;&lt;processId&gt;&lt;index&gt;.log</code>.</p> <p>Default: current working directory</p>
<code>-help</code>	<p>Displays help information.</p>
<code>-remoteAdministrationDomainId &lt;ID&gt;</code>	<p>Enables remote administration and sets the domain ID for remote communication.</p> <p>When remote administration is enabled, <i>Queuing Service</i> will create a <i>DomainParticipant</i>, <i>Publisher</i>, <i>Subscriber</i>, <i>DataWriter</i>, and <i>DataReader</i> in the designated domain.</p> <p>See Chapter 5, Administering Queuing Service from a Remote Location, in the <i>Queuing Service User's Manual</i>.</p> <p>This option overrides the value of the tag <code>&lt;domain_id&gt;</code> within a <code>&lt;administration&gt;</code> tag.</p> <p>This parameter is required when using <code>-cfgRemote</code>.</p> <p>Default: Remote administration is not enabled unless it is enabled from the XML file.</p>

Table 4.1 RTI Queuing Service Command-Line Options

Option	Description
-persistentFilePrefix	Specifies a name prefix to use with all files created by <i>Queuing Service</i> . This option overrides the value of the tag <code>&lt;file_prefix&gt;</code> within <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;</code> . Default: Value in <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;/&lt;file_prefix&gt;</code> .
-persistentStoragePath	Configures the directory for persistent storage. This option overrides the value of the tag <code>&lt;directory&gt;</code> within <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;</code> . Default: Value in <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;/&lt;directory&gt;</code> .
-var <name>=<value>	Sets the value of the variable <code>&lt;name&gt;</code> . This variable can be referenced within the XML configuration files using the <code>\$(&lt;name&gt;)</code> notation. See Section 3.4, Using Variables in XML, in the <i>Queuing Service User's Manual</i> for more information on configuration variables. You may have more than one <code>-var</code> flag on the command line. On Windows platforms, you will need to put quotation marks around the variable name and value, like this: <code>-var "MY_VAR=myvalue"</code>
-verbosity <n>	Controls what type of messages are logged: 0 - Silent 1 - Exceptions ( <i>Connex DDS</i> and <i>Queuing Service</i> ) (default) 2 - Warnings ( <i>Queuing Service</i> ) 3 - Information ( <i>Queuing Service</i> ) 4 - Warnings ( <i>Connex DDS</i> and <i>Queuing Service</i> ) 5 - Tracing ( <i>Queuing Service</i> ) 6 - Tracing ( <i>Connex DDS</i> and <i>Queuing Service</i> ) Each verbosity level, <i>n</i> , includes all the verbosity levels smaller than <i>n</i> .
-version	Prints the <i>Queuing Service</i> version number.

## 4.3 Using Queuing Service as a Windows Service

Windows Services automatically run in the background when the system reboots.

### 4.3.1 Enabling Queuing Service to Run as a Windows Service

If you want to run *Queuing Service* as a Windows Service, you must install it as such before running it. To install it as a Windows Service, run the following command in a terminal with Administrator privileges:

```
<NDDSHOME>\bin\rtiqueuingervice -installService
```

By default, *Queuing Service* is installed with the service name `rtiqueuingervice523`. If you want to install it with a different service name, you can use the `-serviceName` flag. For instance (you would enter this all on one line):

```
<NDDSHOME>\bin\rtiqueuingervice -installService -serviceName mycustomservicename
```

Using the **-serviceName** parameter with different names allows you to install multiple *Queuing Service* instances on the same host.

## 4.3.2 Running RTI Queuing Service as a Windows Service

If you added *Queuing Service* as a Windows Service and want to run it without rebooting, you can start it as a service from the command line with the Windows **sc** utility:

```
sc <serviceName> start
```

By default, it will start *Queuing Service* with the "defaultService" configuration that is stored in `<NDDSHOME>\resource\xml\RTI_QUEUEING_SERVICE.xml`. This configuration contains a service running with an empty SharedSubscriber with remote administration and monitoring enabled.

If you want to start *Queuing Service* with different parameters, you can use the utility **nssm**. You can specify the parameters from the command line by setting the option **AppParameters**. For example (you would enter this all on one line):

```
%NDDSHOME%\resource\app\bin\x64Win64VS2008\nssm.exe set <serviceName> AppParameters "<queuing service arguments>"
```

For more information and examples, see [4.3.3 Notes when Running as a Windows Service below](#).

Additionally, you can start *Queuing Service* from the Windows Services Control Manager. From the Start Menu, select **Control Panel, Administrative Services, Services**. Click on the service in the list, then right-click to select **Start**.

## 4.3.3 Notes when Running as a Windows Service

Here are some things to consider when running *Queuing Service* as a Windows Service:

- All AppParameters arguments must be enclosed in quotation marks.
- To refer to variables in the XML configuration file, use the *Queuing Service* command-line option **-var** to set the variable's value. The syntax for referring to a variable in the XML file is:

```
<name>$(NAME) </name>
```

- For the AppParameters passed to nssm, use **-var** like this:

```
-var MY_DOMAIN=10
```

For example (you would enter this all on one line):

```
%NDDSHOME%\resource\app\bin\x64Win64VS2008\nssm.exe set rtiqueuingervice523
AppParameters
"-cfgFile \"C:\dir with spaces\qsconf-with-vars.xml\"
-cfgName MyCustomConf -var MY_DOMAIN=10"
```

- If a variable value includes spaces, you must enclose the value in escaped quotes. For example (you would enter this all on one line):

```
%NDDSHOME%\resource\app\bin\x64Win64VS2008\nssm.exe
set rtiqueuingervice523 AppParameters
"-cfgFile \"C:\dir with spaces\qsconf-with-vars.xml\"
-cfgName MyCustomConf -var \"NAME=My QS name\""
```

- If you use environment variables instead of the **-var** command-line option, you may need to restart your Windows machine.
- If you specify **-cfgFile** in the Start Parameters field, you must use the full path to the file.
- Some versions of Windows do not allow Windows Services to communicate with other services/applications using shared memory. For this reason, if you plan to run *Queuing Service* as Windows Service, you should disable the shared-memory transport in all the DomainParticipants created by *Queuing Service* and in the applications communicating with *Queuing Service*. For more information on setting builtin transports, see the *RTI Connex DDS Core Libraries User's Manual* (Section 15.1, Builtin Transport Plugins).
- In some scenarios, you may need to add a multicast address (e.g., builtin.udpv4://239.255.0.1) to your discovery peers. For details on setting the discovery peers, see the *RTI Connex DDS Core Libraries Getting Started Guide* (Section 4.1.2, How to Set Your Discovery Peers).

### 4.3.4 Stopping Queuing Service when it is Running as a Windows Service

To stop *Queuing Service* when it is running as a Windows Service, use this command:

```
sc rtiqueuingervice523 stop
```

You can also start/stop *Queuing Service* from the Windows Services Control Manager. From the Start menu, select **Control Panel, Administrative Services, Services**. Click on the service in the list, then right-click to select **Start** or **Stop**.

### 4.3.5 Disabling Queuing Service from Running as a Windows Service

To remove *Queuing Service* from the list of Windows Services on your system, run this command in a terminal with Administrator privileges:

```
<NDDSHOME>\bin\rtiqueuingervice -uninstallService
```

By default, the service **rtiqueuingervice523** is uninstalled. If you want to uninstall a different service instance, add the **-serviceName** option to the above command.