

RTI Queuing Service

Getting Started Guide

Version 7.3.0



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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 QueueConsumers 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®*. The default installation paths are:

- macOS® systems:
/Applications/rti_connex_dds-7.3.0
- Linux systems, non-*root* user:
/home/<your user name>/rti_connex_dds-7.3.0
- Linux systems, *root* user:
/opt/rti_connex_dds-7.3.0

- Windows® systems, user without Administrator privileges:
`<your home directory>\rti_connex_dds-7.3.0`
- Windows systems, user with Administrator privileges:
`C:\Program Files\rti_connex_dds-7.3.0`

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_connex_dds-7.3.0\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:

- macOS systems: `/Users/<your user name>/rti_workspace/7.3.0/examples`
- Linux systems: `/home/<your user name>/rti_workspace/7.3.0/examples`
- Windows systems: `<your Windows documents folder>\rti_workspace\7.3.0\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 Connex Installation Guide*.

Chapter 2 Installing Queuing Service

This chapter describes:

- [2.1 Installing on a Linux or macOS System below](#)
- [2.2 Installing on a Windows System on the next page](#)

2.1 Installing on a Linux or macOS System

Install *Queuing Service* on top of *Connex*. 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*. 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 three ways to start *Queuing Service*:

- [4.1 Starting from Launcher below](#)
- [4.2 Starting Manually from the Command Line below](#)
- [4.3 Using Queuing Service as a Windows Service on page 10](#)

If you are starting *Queuing Service* as a Windows Service, also read [4.3 Using Queuing Service 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
```

To run this service executable on a *target* system (not your host development platform), you must first select the target architecture. To do so, either:

Set the environment variable **CONNEXTDDS_ARCH** to the name of the target architecture. (Do this for each command shell you will be using.)

Or set the variable **connextdds_architecture** in the file **rticommon_config.[sh/bat]**^a to the name of the target architecture. If the **CONNEXTDDS_ARCH** environment variable is set, the architecture in this file will be ignored.

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 <name></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 RTI_Queuing_Service.</p>
<code>-cfgFile <name></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 <name></code>	<p>Specifies a configuration name. <i>Queuing Service</i> will look for a matching <code><queuing_service></code> tag in the configuration file.</p> <p>This parameter is required unless <code>-cfgRemote</code> is used.</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 <n></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 <ID></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>

^aThis file is resource/scripts/rticommon_config.sh on Linux or macOS systems, resource/scripts/rticommon_config.bat on Windows systems.

Table 4.1 RTI Queuing Service Command-Line Options

Option	Description
-heapSnapshotPeriod	<p>Enables heap monitoring.</p> <p><i>Queuing Service</i> will generate a heap snapshot every <sec>.</p> <p>Default: heap monitoring is disabled.</p>
-heapSnapshotDir	<p>When heap monitoring is enabled, this parameter configures the directory where the snapshots will be stored. The snapshot filename format is RTI_<configurationName><processId><index>.log.</p> <p>Default: current working directory</p>
-help	Displays help information.
-remoteAdministrationDomainId <ID>	<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 <domain_id> within a <administration> tag.</p> <p>This parameter is required when using -cfgRemote.</p> <p>Default: Remote administration is not enabled unless it is enabled from the XML file.</p>
-persistentFilePrefix	<p>Specifies a name prefix to use with all files created by <i>Queuing Service</i>.</p> <p>This option overrides the value of the tag <file_prefix> within <persistence_settings>/<filesystem>.</p> <p>Default: Value in <persistence_settings>/<filesystem>/<file_prefix>.</p>
-persistentStoragePath	<p>Configures the directory for persistent storage.</p> <p>This option overrides the value of the tag <directory> within <persistence_settings>/<filesystem>.</p> <p>Default: Value in <persistence_settings>/<filesystem>/<directory>.</p>
-var <name>=<value>	<p>Sets the value of the variable <name>. This variable can be referenced within the XML configuration files using the \${<name>} notation. See Section 3.4, Using Variables in XML, in the <i>Queuing Service User's Manual</i> for more information on configuration variables.</p> <p>You may have more than one -var flag on the command line.</p> <p>On Windows platforms, you will need to put quotation marks around the variable name and value, like this:</p> <pre>-var "MY_VAR=myvalue"</pre>
-verbosity <n>	<p>Controls what type of messages are logged:</p> <ul style="list-style-type: none"> 0 - Silent 1 - Exceptions (<i>Connex</i> and <i>Queuing Service</i>) (default) 2 - Warnings (<i>Queuing Service</i>) 3 - Information (<i>Queuing Service</i>) 4 - Warnings (<i>Connex</i> and <i>Queuing Service</i>) 5 - Tracing (<i>Queuing Service</i>) 6 - Tracing (<i>Connex</i> and <i>Queuing Service</i>) <p>Each verbosity level, <i>n</i>, includes all the verbosity levels smaller than <i>n</i>.</p>
-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. If you want to run *Queuing Service* as a Windows Service, use a Windows service wrapper such as **nssm** or **winsw**. For instance, you can download **nssm** from <https://nssm.cc/download>. Follow the product's documentation to set up *Queuing Service* as a Windows service. For example, for **nssm**, see <https://nssm.cc/usage>.

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

- 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 a 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 [Builtin Transport Plugins, in the RTI Connex Core Libraries User's Manual](#).
- 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 information about setting discovery peers in the "Troubleshooting" section of *Introduction to Publish/Subscribe*, in the [RTI Connex Getting Started Guide](#).