

# **RTI Queuing Service**

## **Getting Started Guide**

**Version 6.1.1**



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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:

- macOS® systems:  
`/Applications/rti_connex_dds-6.1.1`
- Linux systems, non-*root* user:  
`/home/<your user name>/rti_connex_dds-6.1.1`
- Linux systems, *root* user:  
`/opt/rti_connex_dds-6.1.1`

- Windows® systems, user without Administrator privileges:  
`<your home directory>\rti_connex_dds-6.1.1`
- Windows systems, user with Administrator privileges:  
`C:\Program Files\rti_connex_dds-6.1.1`

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-6.1.1\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/6.1.1/examples`
- Linux systems: `/home/<your user name>/rti_workspace/6.1.1/examples`
- Windows systems: `<your Windows documents folder>\rti_workspace\6.1.1\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 DDS 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 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 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 9](#)

If you are starting *Queuing Service* as a Windows Service, also read [4.3 Using Queuing Service as a Windows Service on page 9](#).

## 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]**<sup>a</sup> 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   |
|-----------------------|---|
| -appName <name>       | <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 <b>-cfgName</b>, if present, otherwise it is <b>RTI_Queuing_Service</b>.</p>  |
| -cfgFile <name>       | <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>  |
| -cfgName <name>       | <p>Specifies a configuration name. <i>Queuing Service</i> will look for a matching <b>&lt;queuing_service&gt;</b> tag in the configuration file.</p> <p><b>This parameter is required unless -cfgRemote is used.</b></p>  |
| -cfgRemote            | <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 <b>-remoteAdministrationDomainId</b> 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 <b>-cfgName</b>, 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 <b>-cfgRemoteTimeout</b>), it will load the configuration from the input configuration file(s).</p> |
| -cfgRemoteTimeout <n> | <p>Specifies the maximum amount of time, in seconds, that <i>Queuing Service</i> will wait for an initial configuration when using <b>-cfgRemote</b>.</p> <p>Default: 20 seconds</p>  |
| -daemon               | <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>   |

<sup>a</sup>This 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   |
|---|---|
| <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> |
| <code>-persistentFilePrefix</code>                    | <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 <code>&lt;file_prefix&gt;</code> within <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;</code>.</p> <p>Default: Value in <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;/&lt;file_prefix&gt;</code>.</p>  |
| <code>-persistentStoragePath</code>                   | <p>Configures the directory for persistent storage.</p> <p>This option overrides the value of the tag <code>&lt;directory&gt;</code> within <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;</code>.</p> <p>Default: Value in <code>&lt;persistence_settings&gt;/&lt;filesystem&gt;/&lt;directory&gt;</code>.</p>  |
| <code>-var &lt;name&gt;=&lt;value&gt;</code>          | <p>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.</p> <p>You may have more than one <code>-var</code> 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>   |

Table 4.1 RTI Queuing Service Command-Line Options

| Option         | Description   |
|----------------|---|
| -verbosity <n> | Controls what type of messages are logged:<br>0 - Silent<br>1 - Exceptions ( <i>Connex DDS</i> and <i>Queuing Service</i> ) (default)<br>2 - Warnings ( <i>Queuing Service</i> )<br>3 - Information ( <i>Queuing Service</i> )<br>4 - Warnings ( <i>Connex DDS</i> and <i>Queuing Service</i> )<br>5 - Tracing ( <i>Queuing Service</i> )<br>6 - Tracing ( <i>Connex DDS</i> and <i>Queuing Service</i> )<br>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. 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 DDS 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 DDS Getting Started Guide](#).