

RTI Queuing Service

Getting Started Guide

Version 5.2.3



Your systems. Working as one.



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Contents

1	Welcome to RTI Queuing Service.....	1-1
2	Installing Queuing Service	2-1
2.1	Paths Mentioned in Documentation	2-1
2.2	Installing on a UNIX-Based System	2-3
2.3	Installing on a Windows System	2-3
3	Using the Examples.....	3-1
4	Running Queuing Service	4-1
4.1	Starting from Launcher	4-1
4.2	Starting Manually from the Command Line.....	4-2
4.3	Using Queuing Service as a Windows Service	4-4
4.3.1	Enabling Queuing Service to Run as a Windows Service.....	4-4
4.3.2	Running RTI Queuing Service as a Windows Service.....	4-4
4.3.3	Notes when Running as a Windows Service.....	4-4
4.3.4	Stopping Queuing Service when it is Running as a Windows Service	4-5
4.3.5	Disabling Queuing Service from Running as a Windows Service	4-5

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.

Chapter 2 Installing Queuing Service

This chapter describes:

- ❑ [Paths Mentioned in Documentation \(Section 2.1\)](#)
- ❑ [Installing on a UNIX-Based System \(Section 2.2\)](#)
- ❑ [Installing on a Windows System \(Section 2.3\)](#)

2.1 Paths Mentioned in Documentation

The documentation refers to:

❑ <NDDSHOME>

This refers to the installation directory for *Connexx DDS*.

The default installation paths are:

- Mac OS X systems:
/Applications/rti_connexx_dds-version
- UNIX-based systems, non-*root* user:
/home/your user name/rti_connexx_dds-version
- UNIX-based systems, *root* user:
/opt/rti_connexx_dds-version
- Windows systems, user without Administrator privileges:
<your home directory>\rti_connexx_dds-version
- Windows systems, user with Administrator privileges:
C:\Program Files\rti_connexx_dds-version (for 64-bits machines) or
C:\Program Files (x86)\rti_connexx_dds-version (for 32-bit machines)

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_connext_dds-version\bin\rtiddsgen"

or if you have defined the NDDSHOME environment variable:

"%NDDSHOME%\bin\rtiddsgen"

❑ RTI Workspace directory, **rti_workspace**

The RTI Workspace is where all configuration files for the applications and example files are located. All configuration files and examples are copied here the first time you run *RTI Launcher* or any script in <NDDSHOME>/bin. The default path to the RTI Workspace directory is:

- Mac OS X systems:
/Users/your user name/rti_workspace
- UNIX-based systems:
/home/your user name/rti_workspace
- Windows systems:
your Windows documents folder\rti_workspace

Note: '*your Windows documents folder*' depends on your version of Windows.

For example, on Windows 7, the folder is **C:\Users\your user name\Documents**; on Windows Server 2003, the folder is **C:\Documents and Settings\your user name\Documents**.

You can specify a different location for the **rti_workspace** directory. See the *RTI Connex DDS Core Libraries Getting Started Guide* for instructions.

❑ <path to examples>

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

By default, the examples are copied to **rti_workspace/version/examples**

So the paths are:

- Mac OS X systems:
/Users/your user name/rti_workspace/version/examples
- UNIX-based systems:
/home/your user name/rti_workspace/version/examples
- Windows systems:
your Windows documents folder\rti_workspace\version\examples

Note: '*your Windows documents folder*' is described above.

You can specify that you do not want the examples copied to the workspace. See the *RTI Connex DDS Core Libraries Getting Started Guide* for instructions.

2.2 Installing on a UNIX-Based System

Install *Queuing Service* on top of *Connexrt 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 [Paths Mentioned in Documentation \(Section 2.1\)](#).
2. From the Utilities tab, select **RTI Package Installer**.
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 [Paths Mentioned in Documentation \(Section 2.1\)](#)).

2.3 Installing on a Windows System

Install *RTI Queuing Service* on top of *RTI Connexrt™ 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 [Paths Mentioned in Documentation \(Section 2.1\)](#).

2. From the Services tab, select **Queuing Service**.
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 [Paths Mentioned in Documentation \(Section 2.1\)](#)).

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 [Paths Mentioned in Documentation \(Section 2.1\)](#) 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*:

- ☐ [Starting from Launcher \(Section 4.1\)](#)
- ☐ [Starting Manually from the Command Line \(Section 4.2\)](#)
- ☐ [Using Queuing Service as a Windows Service \(Section 4.3\)](#)

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

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/rtiqueuingservice [options]
```

Example:

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

Table 4.1 describes the command-line options.

Table 4.1 RTI Queuing Service Command-Line Options

Option	Description
-appName <name>	Assigns a name to the execution of <i>Queuing Service</i> . Remote commands will refer to the queuing service using this name. In addition, the name of <i>DomainParticipants</i> created by <i>Queuing Service</i> will be based on this name. Default: The name given with -cfgName , if present, otherwise it is RTI_Queueing_Service .
-cfgFile <name>	Specifies a configuration file to be loaded. This parameter is required. See Section 3.1, How to Load the XML Configuration, in the <i>Queuing Service User's Manual</i> .
-cfgName <name>	Specifies a configuration name. <i>Queuing Service</i> will look for a matching <queuing_service> tag in the configuration file. This parameter is required unless -cfgRemote is used.
-cfgRemote	Specifies that the initial configuration of the service must be obtained remotely from other running instances. Using this option also requires the use of -remoteAdministrationDomainId to enable remote administration, because the initial configuration will be received in the remote administration domain ID. If you use this option and -cfgName , the service will wait until a configuration with that name is received. Otherwise, the service will use the first configuration that it receives. If the service does not receive the initial configuration after a configurable timeout (see -cfgRemoteTimeout), it will load the configuration from the input configuration file(s).
-cfgRemoteTimeout <n>	Specifies the maximum amount of time, in seconds, that <i>Queuing Service</i> will wait for an initial configuration when using -cfgRemote . Default: 20 seconds
-daemon	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.
-domainIdBase <ID>	Sets the base domain ID. This value is added to the domain IDs in the configuration file. For example, if you set -domainIdBase to 50 and use domainIDs 0 and 1 in the configuration file, then <i>Queuing Service</i> will use domains 50 and 51. Default: 0
-help	Displays help information.

Table 4.1 RTI Queuing Service Command-Line Options

Option	Description
-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 <i>Queuing Service</i> 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>Connexx DDS</i> and <i>Queuing Service</i>) (default) 2 - Warnings (<i>Queuing Service</i>) 3 - Information (<i>Queuing Service</i>) 4 - Warnings (<i>Connexx DDS</i> and <i>Queuing Service</i>) 5 - Tracing (<i>Queuing Service</i>) 6 - Tracing (<i>Connexx DDS</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.

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_QUEUING_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 [Notes when Running as a Windows Service \(Section 4.3.3\)](#).

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
rtiqueuingservice523 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 rtiqueuingservice523 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 Connext 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 Connext 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 rtiqueuingservice523 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\rtiqueuingservice -uninstallService
```

By default, the service **rtiqueuingservice523** is uninstalled. If you want to uninstall a different service instance, add the **-serviceName** option to the above command.