

RTI Connex DDS

Installation Guide

Version 6.1.0



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The security features of this product include software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>). This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

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Contents

Chapter 1 Installing RTI Connex DDS	1
Chapter 2 Paths Mentioned in Documentation	8
Chapter 3 License Management	
3.1 Installing the License File	10
3.2 Adding or Removing License Management	12
Chapter 4 Controlling Location for RTI Workspace and Copying of Examples	13
Chapter 5 Special Backup of RTI Libraries	15
Chapter 6 Uninstalling Connex DDS	16

Chapter 1 Installing RTI Connex DDS

RTI® Connex® DDS is delivered as static and dynamic libraries with development tools, examples, and documentation that will help you use the libraries.

Connex DDS distributions are provided in two types of bundles: *hosts* and *targets*.

- A *host* bundle contains non-target-specific files, such as documentation, header files, tools, and infrastructure services executables. The host bundle is provided in a **.run**, **.exe**, or **.dmg** file that will run an installer.

Host bundles are named:

- **rti_connex_dds-<version>-<package_type>-host-<host-platform>.<extension>**

The `<package_type>` is usually **pro**.

Note: The legacy **core** package type does not include all functionality. Please contact your local RTI sales representative or email sales@rti.com for more information.

The `<host_platform>` depends on your development platform, such as **x64Win64** for a 64-bit Windows platform.

The `<extension>` is **run** for Linux systems, **exe** for Windows systems, or **dmg** for macOS systems.

- A *target* bundle contains libraries and any applications that have target-specific dependencies. A target bundle is an “RTI Package” (***.rtipkg**) file that must be installed on top of your host bundle. .

Target bundles are named:

- **rti_connex_dds-<version>-<package_type>-target-<target_architecture>.rtipkg**

The `<target_architecture>` depends on your target machine (where you will deploy your completed application). These strings are listed in the *Connex DDS Platform Notes*; examples are **x64Win64VS2017** and **armv8Linux4gcc7.3.0**.

Notes:

- You may have more than one target bundle if you are developing for multiple targets.
 - If you have an LM ("lm") package type, you will not have a target bundle.
 - If you are installing an LM package, host and target are included in the same bundle:
 - The package is named as follows:
 - **rti_connex_dds-<version>-lm-<target_architecture>.<extension>**
- For example: **rti_connex_dds-6.1.0-lm-x64Win64VS2017.exe**.
- The package installation includes *RTI Security Plugins* and OpenSSL® version 1.1.1k. The installer provides a prebuilt version of OpenSSL 1.1.1k. If you wish to build your own version of OpenSSL 1.1.1k, you can find the source code here: <https://www.openssl.org/source/>.
 - If you are installing a patch, read [Chapter 5 Special Backup of RTI Libraries on page 15](#).

There are two ways to install a *Connex DDS* host bundle:

- using an installer, which will prompt you for information such as where to install, or
- using a script, which allows you to run in "unattended mode" so you will not be prompted for information while it is installing.

Both ways are described below.

Running in Unattended Mode

When running in unattended mode, the installer will use default values for its parameters unless you specify them at the command line (see [Table 1.1 Command-Line Options when Installing from a Script](#)).

Table 1.1 Command-Line Options when Installing from a Script

Parameter	Values	Meaning	Default
--mode	win32 gtk xwindows osxqt text [not available on Windows] unattended [all platforms] [not available for "lm" package]	Should the installer display a graphical or a text-based UI? Should the installer ask for user feedback?	GUI available on your platform

Parameter	Values	Meaning	Default
--unattendedmodeui	none [not available on Windows] minimal [not available on Windows] minimalWithDialogs [required on Windows if using --mode unattended]	If you chose --mode unattended, how much graphical feedback should the installer display?	none
--prefix	directory to install into	The installation directory the product will be placed into. Note that the installer will always place the product in a directory named rti_connex_dds-6.1.0. See Chapter 2 Paths Mentioned in Documentation on page 8	Platform-dependent Windows Example: c:\program files\rti_connex_dds-6.1.0
--install_spreadsheet_addin [Windows only]	true false	Also install RTI Spreadsheet Addin?	false
--disable_copy_examples	true false	Should the installer disable the copying of examples into rti_workspace during installation (true) or not (false)?	false

Installing on a Linux System

In these instructions, we assume your host bundle is named **rti_connex_dds-6.1.0-pro-host-x64Linux.run** and your target bundle is named **rti_connex_dds-pro-target-6.1.0-armv8Linux4gcc7.3.0.rtipkg**. Your filenames will be different depending on your package type and architecture.

1. Download the host and target(s) bundles to a location of your choice; for example, **/home/<your user name>/Downloads**.
2. Install the host bundle. As described above, you can use an installer or a script:
 - Using the installer:

Run the host bundle installer (the **.run** file). For example:

```
/home/<your user name>/Downloads/rti_connex_6.1.0-dds-pro-host-x64Linux.run
```

Follow the on-screen prompts. You will be asked if you want to use the default installation directory (**/home/<your user name>**) or specify a different path. We refer to the installation directory as **<NDDSHOME>**, see [Chapter 2 Paths Mentioned in Documentation on page 8](#).

- Using a script:

Run from a command prompt:

```
rtd_dds-6.1.0-<package_type>-host-<host_platform>.run
--mode unattended --prefix <installation path>
```

The **--prefix** option allows you to specify the installation directory; if you omit this, the installer will install into a default location.

For example (enter on one line):

```
rtd_dds-6.1.0-pro-host-x64Linux.run
--mode unattended --prefix /home/user/rtd_dds-6.1.0
```

Note: You cannot run the installer from a script if you have an LM package (with "lm" in its file name).

3. Install the target bundle(s). There are two ways to do this:

- From *RTI Launcher*:

Start *RTI Launcher* (<NDDSHOME>/bin/rtilauncher), select the **Configuration** tab, and click on **Install RTI Packages**. Add the location of your target file. Click **Install**.

- From the command line:

Open a command prompt and change to the **rtd_dds-6.1.0/bin** directory. Use <NDDSHOME>/bin/rtipkginstall to install the target bundle. For example (enter on one line):

```
rtipkginstall
/home/<your user name>/Downloads/rtd_dds-6.1.0-pro-target-
armv8Linux4gcc7.3.0.rtipkg
```

4. Read [Chapter 3 License Management on page 10](#).

After installation:

- From *Launcher*, right-click each icon to access documentation about that component. See the *RTI Launcher User's Manual* (in <NDDSHOME>/doc/manuals/connex_dds_professional/tools/launcher).
- See the *RTI Connex DDS Getting Started Guide* (in <NDDSHOME>/doc/manuals/connex_dds_professional/getting_started_guide).

Installing on a Windows System

In these instructions, we assume your host bundle is named **rtd_dds-6.1.0-pro-host-x64Win64.exe** and your target bundle is named **rtd_dds-6.1.0-pro-target-x64Win64VS2017.rtipkg**. Your filenames will be different depending on your package type and architecture.

Depending on your version of Windows and where you want to install these files, your user account may or may not require administrator privileges.

1. Download the host and target(s) bundles to a location of your choice; for example, **C:\Users\\Downloads**.
2. Install the host bundle. As described above, you can use an installer or a script:

- Using the installer:

From your file explorer, open (double-click) the host bundle installer (the **.exe** file).

Follow the on-screen prompts. You will be asked if you want to use the default installation directory (**C:\Program Files**) or specify a different path.

- Using a script:

Run from a command prompt:

```
rti_connex_dds-<version>-<package_type>-host-<host_platform>.exe
--mode unattended --unattendedmodeui minimalWithDialogs --prefix <installation
path>
```

The **--prefix** option allows you to specify the installation directory. If you do not specify a prefix, the installer will install into a default location.

For example (enter on one line):

```
rti_connex_dds-6.1.0-pro-host-x64Win64.exe --mode unattended
--unattendedmodeui minimalWithDialogs --prefix c:\program files\rti_connex_dds-
6.1.0
```

When running in unattended mode on a Windows system, you must specify **--unattendedmodeui minimalWithDialogs** or the installation will fail.

3. Install the target bundle(s). There are two ways to do this:
 - From *RTI Launcher*:

Start *RTI Launcher* (<NDDSHOME>\bin\rtilauncher or from the Windows **Start** menu), select the **Configuration** tab, and click on **Install RTI Packages**. Add the location of your package file. Click **Install**.

- From the command line:

Open a command prompt and change to the **rti_connex_dds-6.1.0\bin** directory. Use the **rtipkginstall** batch file to install the target bundle. For example (enter on one line):

```
rtipkginstall C:\Users\\Downloads\rti_connex_dds-6.1.0-pro-target-
x64Win64VS2017.rtipkg
```

4. Read [Chapter 3 License Management on page 10](#).

After installation:

- From *Launcher*, right-click each icon to access documentation about that component. See the *RTI Launcher User's Manual* (in `<NDDSHOME>\doc\manuals\connex_dds_professional\tools\launcher`).
- See the *RTI Connex DDS Getting Started Guide* (in `<NDDSHOME>\doc\manuals\connex_dds_professional/getting_started_guide`).

Installing on a macOS System

In these instructions, we assume your host bundle is named `rti_connex_dds-6.1.0-pro-host-darwin.dmg` and your target bundle is named `rti_connex_dds-6.1.0-pro-target-x64Darwin17clang9.0.rtipkg`. Your filenames will be different depending on your package type and architecture.

1. Download the host and target(s) bundles to a location of your choice; for example, `/Users/<your user name>/Downloads`.
2. Double-click on the host bundle `.dmg` file. You should see a screen appear.
3. Double-click on the icon in the screen to run the installer application.
4. Follow the on-screen prompts. You will be asked if you want to use the default installation directory (`/Applications/rti_connex_dds-6.1.0` or specify a different path. Note that the installer will always place the product inside a folder named `rti_connex_dds-6.1.0`. We refer to the installation directory as `<NDDSHOME>`, see [Chapter 2 Paths Mentioned in Documentation on page 8](#).
5. Install the target bundle(s). There are two ways to do this:

- From *RTI Launcher*:

Start *RTI Launcher* (`<NDDSHOME>/RTI Launcher`), select the Configuration tab, and click on **Install RTI Packages**. Add the location of your target file. Click **Install**.

- From the command line:

Open a command prompt and change to the `rti_connex_dds-6.1.0/bin` directory. Use `<NDDSHOME>/bin/rtipkginstall` to install the target bundle. For example (enter on one line):

```
rtipkginstall /Users/<your user name>/Downloads/rti_connex_dds-6.1.0-pro-target-x64Darwin17clang9.0.rtipkg
```

6. Read [Chapter 3 License Management on page 10](#).

After installation:

- From *Launcher*, right-click each icon to access documentation about that component. See the *RTI Launcher User's Manual* (in `<NDDSHOME>/doc/manuals/connex_dds_professional/tools/launcher`).

- See the *RTI Connex DDS Getting Started Guide* (in `<NDDSHOME>/doc/manuals/connex_dds_professional/getting_started_guide`).

Chapter 2 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-6.1.0
- Linux systems, non-*root* user:
/home/<your user name>/rti_connex_dds-6.1.0
- Linux systems, *root* user:
/opt/rti_connex_dds-6.1.0
- Windows® systems, user without Administrator privileges:
<your home directory>\rti_connex_dds-6.1.0
- Windows systems, user with Administrator privileges:
C:\Program Files\rti_connex_dds-6.1.0

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_connext_dds-6.1.0\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/6.1.0/examples**
- Linux systems: **/home/<your user name>/rti_workspace/6.1.0/examples**
- Windows systems: **<your Windows documents folder>\rti_workspace\6.1.0\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 [Chapter 4 Controlling Location for RTI Workspace and Copying of Examples on page 13](#).

Chapter 3 License Management

Tools like *RTI Admin Console*, which are included in the Professional package, require a license *file* in order to run. A license *file* is never required to deploy your system in production. LM (license-managed) bundles are not for production. If your distribution requires a license file, you will receive one from RTI via email.

If your *Connex DDS* distribution requires a license file, you will receive one from RTI via email.

If you have more than one license file from RTI, you can concatenate them into one file.

A single license file can be used to run on any architecture and is not node-locked. You are not required to run a license server.

3.1 Installing the License File

Save the license file in any location of your choice; the locations checked by the middleware are listed below.

You can also specify the location of your license file in *RTI Launcher's Configuration* tab. Then *Launcher* can copy the license file to the installation directory or to the user workspace.

Each time your *Connex DDS* application starts, it will look for the license file in the following locations until it finds a valid license:

1. In the PropertyQosPolicy of the *DomainParticipant*, there may be a property called **dds.license.license_string**. (Only if you have a license-managed, or "lm," version of *Connex DDS* Professional.) The value for this property can be set to the content of a license file. (This may be necessary if a file system is not supported on your platform.) You can set the property either in source code or in an XML file. An XML file example is shown below:

```
<domain_participant_qos>
  <property>
```

```

    <value>
      <element>
        <name>dds.license.license_string</name>
        <value>contents of license file</value>
      </element>
    </value>
  </property>
</domain_participant_qos>

```

If the content of the license file is in XML, special characters for XML need to be escaped in the license string. Special characters include: quotation marks (") (replace with `"`), apostrophes (') (replace with `'`), greater-than (>) (replace with `>`), less-than (<) (replace with `<`), and ampersands (&) (replace with `&`).

2. In the `PropertyQosPolicy` of the `DomainParticipant`, there may be a property called `dds.license.license_file`. (Only if you have a license-managed, or "lm," version of *Connex DDS Professional*.) The value for this property can be set to the location (full path and filename) of a license file. (This may be necessary if a default license location is not feasible and environment variables are not supported.) You can set the property either in source code or in an XML file.

Example XML to set `dds.license.license_file`:

```

<domain_participant_qos>
  <property>
    <value>
      <element>
        <name>dds.license.license_file</name>
        <value>path to license file</value>
      </element>
    </value>
  </property>
</domain_participant_qos>

```

3. In the location specified in the environment variable `RTI_LICENSE_FILE`, which you may set to point to the full path of the license file, including the filename.

Note: When you run any of the scripts in the `<NDDSHOME>/bin` directory, this automatically sets the `RTI_LICENSE_FILE` environment variable (if it isn't already set) prior to calling the executable. It looks for the license file in two places: your `rti_workspace` directory and the installation directory (`NDDSHOME`). (See [Chapter 2 Paths Mentioned in Documentation on page 8](#).)

4. If you are running any of the tools/services as executables via `NDDSHOME/bin/<executable script>` or through *Launcher*:
 - In your `rti_workspace/<version>` directory, in a file called `rti_license.dat`.
 - In your `rti_workspace` directory, in a file called `rti_license.dat`.

- In <NDDSHOME> (the *Connex* DDS installation directory), in a file called **rti_license.dat**.
5. If you are running your own application linked with *Connex* DDS libraries:
- In your current working directory, in a file called **rti_license.dat**.
 - In <NDDSHOME> (the *Connex* DDS installation directory), in a file called **rti_license.dat**.

As *Connex* DDS attempts to locate and read your license file, you may (depending on the terms of the license) see a printed message with details about your license.

If the license file cannot be found or the license has expired, your application may be unable to initialize *Connex* DDS, depending on the terms of the license. If that is the case, your application's call to **DomainParticipantFactory.create_participant()** will return null, preventing communication.

If you have any problems with your license file, please email support@rti.com.

3.2 Adding or Removing License Management

If you are using a package type that requires a license file and your license file changes—for example, you receive a new license for a longer term than your original license—you do not need to reinstall *Connex* DDS.

However, if you switch from a license-managed distribution of *Connex* DDS to one of the same version that does not require license management, or vice versa, RTI recommends that you first uninstall your original distribution before installing your new distribution. Doing so will prevent you from inadvertently using a mixture of libraries from multiple installations.

Chapter 4 Controlling Location for RTI Workspace and Copying of Examples

By default, the **rti_workspace** directory is created here:

- Linux systems: **/home/<your user name>/rti_workspace**
- macOS systems: **/Users/<your user name>/rti_workspace**
- Windows systems: **<your Windows documents folder>\rti_workspace**

Here's how to specify a different location for **rti_workspace** and/or disable copying the examples into the workspace.

Linux and macOS systems:

- To configure the behavior for *all* users, edit **<NDDSHOME>/resource/scripts/rticommon_config.sh**.
- To configure the behavior for the *current* user (takes precedence), create **\$HOME/.rti/rticommon_config.sh** as follows:

```
# Customize RTI Workspace Directory and Copy Behavior
#####
# copy_examples=false
# workspace_dir=$HOME/rti_workspace
```

Uncomment the line(s) that you want to use (remove the #).

Windows systems:

- To configure the behavior for *all* users, edit **<NDDSHOME>\resource\scripts\rticommon_config.bat**.

- To configure the behavior for the *current* user (takes precedence), create **<your home directory>\rti\rticommon_config.bat** as follows:

```
@REM Customize RTI Workspace Directory and Copy Behavior
@REM #####
@REM set copyExamples=false
@REM set "workspaceDir=C:\Users\%USERNAME%\Documents\rti_workspace"
```

Uncomment the line(s) that you want to use (delete "@REM" at the start of the line).

Chapter 5 Special Backup of RTI Libraries

When installing a new RTI package that overwrites the libraries in the `<NDDSHOME>/lib/<architecture>` directory, a backup will be created of all the previous libraries in the `<NDDSHOME>/lib/<architecture>` directory. That backup will be created in `<NDDSHOME>/lib/<architecture>/<current_installed_version>`.

For example, if you install a patch version 6.1.0.x to the RTI core libraries for x64Win64VS2017, your 6.1.0 libraries will be copied into the following directory before the 6.1.0.x libraries are installed: `<NDDSHOME>/lib/x64Win64VS2017/6.1.0`.

If you install another patch later, before the 6.1.0.x libraries are overwritten, they will be copied into `<NDDSHOME>/lib/x64Win64VS2017/6.1.0.x`.

Chapter 6 Uninstalling Connex DDS

To uninstall *Connex DDS*, run the uninstaller application.

- On Windows platforms:

If available from the Start Menu, run the uninstaller by clicking on the **Uninstall RTI Connex DDS <package>** option. Note that this is not available from the menu on Windows 8 systems. Alternatively, use Add/Remove Programs from the Windows Control Panel to uninstall *Connex DDS*, or run the application from the <NDDSHOME>\uninstall directory.

- On other platforms:

Run the uninstaller from the <NDDSHOME>/uninstall directory.

Note: The uninstaller does not delete the **rti_workspace** directory. To delete all RTI files, delete the **rti_workspace** directory in your home directory. (See [Chapter 2 Paths Mentioned in Documentation on page 8.](#))