

RTI TLS Support

Installation Guide

Version 6.1.1



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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).

Notice

Any deprecations noted in this document serve as notice under the Real-Time Innovations, Inc. Maintenance Policy #4220.

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1 Introduction

RTI® TLS Support is an optional product for use with the TCP transport that is included with *RTI Connexxt® DDS*. If you choose to use *TLS Support*, it must be installed on top of a *Connexxt DDS* installation with the same version number; it can only be used on architectures that support TCP transport.

To see a simple ‘Hello, World’ example application that uses TCP and TLS, look in the **hello_world_tcp** example directory for C. (See [2 Paths Mentioned in Documentation on page 2](#) for the path to the examples.)

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-6.1.1
- 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*.

3 Download Instructions

Download *TLS Support* from the RTI Support Portal, accessible from <https://support.rti.com/>.

You will need your username and password to log into the portal; these are included in the letter confirming your purchase or evaluation copy. If you do not have this letter, please contact license@rti.com.

TLS Support also requires OpenSSL. OpenSSL is available from RTI's Support Portal, or you may obtain it from another source.

Once you have logged into the portal, select the **Downloads** link, then select the appropriate version of *TLS Support* and OpenSSL for your platform.

For *TLS Support*, download both:

- **rti_tls_host_support-6.1.1-<host platform>.rtipkg**
- **rti_tls_support-6.1.1-<target architecture>.rtipkg**

For OpenSSL, download both:

- **openssl-1.1.1n-6.1.1-host-<host platform>.rtipkg**
- **openssl-1.1.1n-6.1.1-target-<target architecture>.rtipkg**

Architecture names are described in the *RTI Connex DDS Core Libraries Platform Notes*.

If you need help with the download process, contact support@rti.com.

4 Installing on Windows Systems

You do not need administrator privileges. All directory locations are meant as examples only; adjust them to suit your site. <NDDSHOME> is described in [2 Paths Mentioned in Documentation on page 2](#).

1. Install the *TLS Support* host and target **.rtipkg** files on top of *Connex* DDS.

There are two ways to install: from *RTI Launcher* or from the command line.

To install from *RTI Launcher*:

- a. Start *RTI Launcher*:

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

- b. From the **Configuration** tab, click on **Install RTI Packages**.
- c. Use the + sign to add the **.rtipkg** files that you want to install.
- d. Click **Install**.

To install from the command line:

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

The installer will put the TLS libraries in <NDDSHOME>\lib\<architecture>.

2. If not already included, add <NDDSHOME>\lib\<architecture> to your Path environment variable. For example (enter this on one line):

```
set PATH=<NDDSHOME>\lib\<architecture>;%PATH%
```

3. Optionally, install the OpenSSL host package. This is needed if you want to use *TLS Support* with tools such as *RTI Admin Console*. (Use the same process that you used for the **.rtipkg** files above.)

4. Install the OpenSSL target package. (Use the same process that you used for the **.rtipkg** files above.)

The installer will put the OpenSSL target libraries in `<NDDSHOME>\third_party\openssl-1.1.1n\<architecture>`.

5. Add the OpenSSL **lib** directory to your Path environment variable. For example, assuming you want to use the "release" version of the OpenSSL libraries (enter this on one line):

```
set PATH=  
<NDDSHOME>\third_party\openssl-1.1.1n\<architecture>\release\lib;%PATH%
```

6. To verify your OpenSSL installation, enter:

```
openssl version
```

You should see a response similar to:

```
OpenSSL <version>
```

If you get a version other than OpenSSL 1.1.1n, your PATH may be pointing with a higher precedence to a different version of OpenSSL. You may need to place version 1.1.1n first or earlier in your PATH.

You may run into this OpenSSL warning:

```
WARNING: can't open config file: [default openssl built-in path]\openssl.cnf
```

To resolve this issue, set the environment variable `OPENSSL_CONF` to the path to the **openssl.cnf** file you are using. For example (enter this all on one line):

```
set OPENSSL_CONF=  
<NDDSHOME>\third_party\openssl-1.1.1n\<architecture>\release\ssl\openssl.cnf
```

5 Installing on Linux and Other Systems

This chapter applies to all supported operating systems except Windows, which is covered in [4 Installing on Windows Systems on page 5](#).

All directory locations are meant as examples only; adjust them to suit your site. <NDDSHOME> is described in [2 Paths Mentioned in Documentation on page 2](#).

1. Install the *TLS Support* host and target **.rtipkg** files on top of *Connex DDS*.

There are two ways to install: from *RTI Launcher* or from the command line.

To install from *RTI Launcher*:

- a. Start *RTI Launcher*:

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

- b. From the **Configuration** tab, click on **Install RTI Packages**.
- c. Use the + sign to add the **.rtipkg** files that you want to install.
- d. Click **Install**.

To install from the command line:

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

The installer will put the TLS libraries in <NDDSHOME>/lib/<architecture>.

2. If not already included, add <NDDSHOME>/lib/<architecture> to your library search path (pointed to by the LD_LIBRARY_PATH environment variable on Linux systems, DYLD_LIBRARY_PATH on macOS systems).

For example (enter this on one line):

```
export LD_LIBRARY_PATH=
<NDDSHOME>/lib/<architecture>:${LD_LIBRARY_PATH}
```

3. Optionally, install the OpenSSL host package. This is needed if you want to use *TLS Support* with tools such as *RTI Admin Console*. (Use the same process that you used for the **.rtipkg** files above.)
4. Install the OpenSSL target package. (Use the same process that you used for the **.rtipkg** files above.)

The installer will put the OpenSSL target libraries in **<NDDSHOME>/third_party/openssl-1.1.1n/<architecture>**.

5. Add the OpenSSL **lib** directory to your library search path. For example, assuming you want to use the "release" version of the OpenSSL libraries (enter this on one line):

```
export LD_LIBRARY_PATH=  
<NDDSHOME>/third_party/openssl-1.1.1n/<architecture>/release/lib:${LD_LIBRARY_PATH}
```

6. To verify your OpenSSL installation, enter:

```
openssl version
```

You should see a response similar to:

```
OpenSSL <version>
```

If you get a version other than OpenSSL 1.1.1n, your PATH may be pointing with a higher precedence to a different version of OpenSSL. You may need to place version 1.1.1n first or earlier in your PATH.

You may run into this OpenSSL warning:

```
WARNING: can't open config file: [default openssl built-in path]/openssl.cnf
```

To resolve this issue, set the environment variable **OPENSSL_CONF** to the path to the **openssl.cnf** file you are using. For example (enter this all on one line):

```
export OPENSSL_CONF=  
<NDDSHOME>/third_party/openssl-1.1.1n/<architecture>/release/ssl/openssl.cnf
```