

RTI TLS Support

Installation Guide

Version 6.1.0



© 2021 Real-Time Innovations, Inc.
All rights reserved.
Printed in U.S.A. First printing.
April 2021.

Trademarks

RTI, Real-Time Innovations, Connex, NDDS, the RTI logo, 1RTI and the phrase, “Your Systems. Working as one,” are registered trademarks, trademarks or service marks of Real-Time Innovations, Inc. All other trademarks belong to their respective owners.

Copy and Use Restrictions

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form (including electronic, mechanical, photocopy, and facsimile) without the prior written permission of Real-Time Innovations, Inc. The software described in this document is furnished under and subject to the RTI software license agreement. The software may be used or copied only under the terms of the license agreement.

This is an independent publication and is neither affiliated with, nor authorized, sponsored, or approved by, Microsoft Corporation.

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).

Technical Support

Real-Time Innovations, Inc.

232 E. Java Drive

Sunnyvale, CA 94089

Phone: (408) 990-7444

Email: support@rti.com

Website: <https://support.rti.com/>

Contents

1 Introduction	1
2 Paths Mentioned in Documentation	2
3 Download Instructions	4
4 Installing on Windows Systems	5
5 Installing on Linux and Other Systems	7

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-6.1.0
- 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_connex_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 *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-6.1.0-<host platform>.rtipkg**
- **rti_tls_support-6.1.0-<target architecture>.rtipkg**

For OpenSSL, download both:

- **openssl-1.1.1k-6.1.0-host-<host platform>.rtipkg**
- **openssl-1.1.1k-6.1.0-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-1.1.1k\<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-1.1.1k\<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 1.1.1k, your PATH may be pointing with a higher precedence to a different version of OpenSSL. You may need to place version 1.1.1k 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-1.1.1k\<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-1.1.1k/<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-1.1.1k/<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 1.1.1k, your PATH may be pointing with a higher precedence to a different version of OpenSSL. You may need to place version 1.1.1k 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-1.1.1k/<architecture>/release/ssl/openssl.cnf
```