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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/).

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1 Introduction

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

The distribution file uses the naming convention, rti-tls-<architecture>.rtipkg, where <architecture> will match your system architecture. (System architecture names are described in the RTI Connext DDS Core Libraries Platform Notes.)

TLS Support also requires OpenSSL. See the TLS Support Release Notes for the version number. OpenSSL is available from RTI’s Support Portal, or you may obtain it from another source.

To see a simple ‘Hello, World’ example application that uses TCP and TLS, look in the hello_world_tcp and hello_builtin_tcp example directories 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® Connext® DDS. The default installation paths are:
  - macOS® systems:
    
    `/Applications/rti_connext.dds-6.0.1`
  - Linux systems, non-root user:
    
    `/home/<your user name>/rti_connext.dds-6.0.1`
  - Linux systems, root user:
    
    `/opt/rti_connext.dds-6.0.1`
  - Windows® systems, user without Administrator privileges:
    
    `<your home directory>\rti_connext.dds-6.0.1`
  - Windows systems, user with Administrator privileges:
    
    `C:\Program Files\rti_connext.dds-6.0.1`

  You may also see `SNDDSHOME` 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-6.0.1\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: `~/rti_workspace/6.0.1/examples`
- Linux systems: `~/.rti_workspace/6.0.1/examples`
- Windows systems: `<your Windows documents folder>\rti_workspace\6.0.1\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 Connext DDS Installation Guide.
3 Installing on UNIX-Based Systems

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 TLS Support on top of Connext DDS. There are two ways to install it: 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 file that you want to install.

   d. Click Install.

   **To install from the command line:**

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

   This will extract files into the existing rti_connext.dds-6.x.y directory. The package installer will put the TLS libraries in <NDDSHOME>/lib/<architecture>.

2. Include <NDDSHOME>/lib/<architecture> in your LD_LIBRARY_PATH environment variable, if it is not already included. For example (enter this on one line):

   ```
   setenv LD_LIBRARY_PATH
   $<NDDSHOME>/lib/i686Linux3gcc4.8.2:$LD_LIBRARY_PATH
   ```

3. Install OpenSSL.

   a. Make sure you have GNU's version of the tar utility, gtar (which handles long file names), and GNU's version of the unzip utility, gunzip.
b. Move the downloaded OpenSSL distribution file to a directory of your choice, such as `/local/rti`, and change to that directory:

```bash
cd /local/rti
```

c. Use `gunzip` to uncompress the OpenSSL file. For example (your filename may be different):

```bash
gunzip openssl-<version>-i86Linux3gcc4.8.2.tar.gz
```

d. Use `gtar` to extract the distribution from the uncompressed file. For example:

```bash
gtar xvf openssl-<version>-i86Linux3gcc4.8.2.tar
```

This will extract files into `/local/rti/openssl-<version>`.

e. Include the resulting `bin` directory for OpenSSL in your PATH. For example, if you install OpenSSL in `/local/rti`, its `bin` directory will be here:

```
/local/rti/openssl-<version>/i86Linux3gcc4.8.2/release/bin
```

An example of setting the PATH is seen below (enter this on one line):

```bash
setenv PATH
/local/rti/openssl-<version>/i86Linux3gcc4.8.2/release/bin:$PATH
```

f. Include the resulting `lib` directory in your `LD_LIBRARY_PATH`. For example, assuming we want to use the "release" version of the OpenSSL libraries (enter this on one line):

```bash
setenv LD_LIBRARY_PATH /local/rti/openssl-<version>/
i86Linux3gcc4.8.2/release/lib:${LD_LIBRARY_PATH}
```

g. To verify your installation, enter:

```
openssl version
```

You should see a response similar to:

```
OpenSSL <version>
```
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 TLS Support on top of Connext DDS. There are two ways to install it: 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` file that you want to install.

   d. Click Install.

   **To install from the command line:**

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

   This will extract files into the existing `rti_connext.dds-6.x.y` directory. The package installer will put the TLS libraries in `<NDDSHOME>\lib\<architecture>`.

2. Add the TLS Support `lib` directory to your `Path` environment variable if it is not already included: `%NDSDHOME%\lib\<architecture>`.

3. Install OpenSSL:

   a. Right-click the distribution file and extract the contents in a directory of your choice.

   b. Add the resulting `bin` directory for OpenSSL to your Path environment variable. For example, if you install OpenSSL in `C:\rti`, its `bin` will be here:
c. To verify your installation, open a command prompt and enter:

```
openssl version
```

You should see a response similar to:

```
OpenSSL <version>
```