



Technical Documentation Version 8.3

OpenSSL Installation



Center for Advanced Decision Support for
Water and Environmental Systems (CADSWES)

UNIVERSITY OF COLORADO **BOULDER**

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Installing OpenSSL for the Web Service DMIs

This document applies to RiverWare Version 8.3 and later only. It provides generic instructions for downloading and installing the version of OpenSSL required by the RiverWare web service dataset connection. If the required OpenSSL version is not already installed on your computer, you must install it before you can use the web service DMIs.

Caution: RiverWare Version 8.3+ requires OpenSSL 1.1.x, any patch level (1.1.1k, for example). Do not use any other version.

About OpenSSL

OpenSSL is an open-source Secure Sockets Layer (SSL) toolkit. OpenSSL creates a secure communications environment for web service connections. See the following site for additional information.

www.openssl.org

Due to licensing restrictions, CADSWES cannot provide the OpenSSL binaries with the RiverWare installation; however, several sites provide the utility free of charge. CADSWES also cannot recommend specific providers, but the OpenSSLWiki, at the following site, provides a list of third-party distributors of precompiled binaries.

wiki.openssl.org/index.php/Binaries

Procedures

To determine whether you need to install the required version of OpenSSL, use the following procedure to display the version that RiverWare is currently using.

- [Display OpenSSL Version](#), page 2

If RiverWare is *not* using OpenSSL 1.1.x, you must use one of the following procedures to download and install it on your computer. Because CADSWES cannot recommend specific providers, these instructions are generic. Use one of the following approaches. In general these are listed in easiest to hardest order.

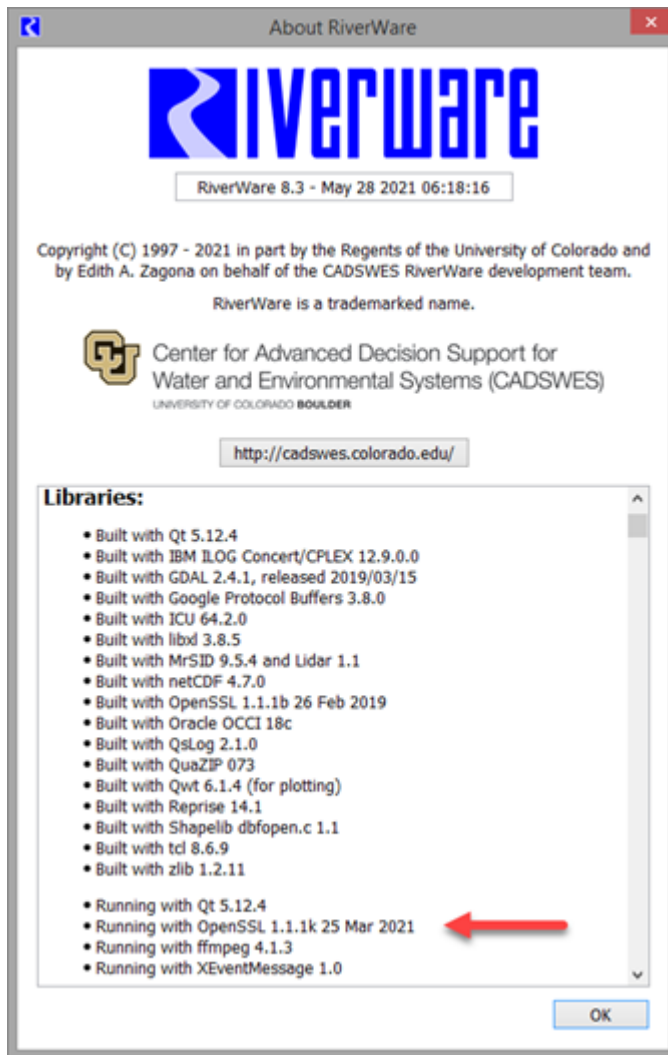
- [Unzip the OpenSSL Download to a Specific Folder](#), page 2
- [Unzip the OpenSSL Download and Update Your User Path](#), page 3
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Display OpenSSL Version

Use this procedure to display the version of OpenSSL that RiverWare is currently using.

1. Start RiverWare on your computer.
2. In the workspace menu, select **Help**, then **About RiverWare**.
3. In the Libraries section of the window, verify the entry: “Running with Open SSL 1.1.1...”

Note: You must install OpenSSL 1.1.1 if RiverWare is not running with it.



Unzip the OpenSSL Download to a Specific Folder

Use this procedure to install the required version of OpenSSL if you are able to unzip files to a specific folder

Caution: RiverWare Version 8.3+ requires OpenSSL 1.1.x, any patch level (1.1.1k, for example). Do not use any other version.

1. Find the correct download, either from the [OpenSSLWiki](#) or from a web search. For example:
openssl-1.1.1k.zip
2. Download the file to your computer.
3. Unzip the file to a temporary folder on your system.
4. Create a folder one level up from the riverware.exe executable. The folder must be named **ExternalDLLs**. For example:
 - if RiverWare is installed in `C:\Program Files\CADSWES\RiverWare 8.3`, then you should create a folder at `C:\Program Files\CADSWES\ExternalDLLs`.
 - if RiverWare is installed in `C:\Users\\AppData\Local\Programs\CADSWES\RiverWare 8.3`, then you should create a folder at `C:\Users\\AppData\Local\Programs\CADSWES\ExternalDLLs`.
5. In the unzipped temporary folder, find the following files and copy them to the new **ExternalDLLs** folder:
 - openssl.exe
 - libcrypto-1_1-x64.dll
 - libssl-1_1-x64.dll
6. Verify RiverWare is now using the required version of OpenSSL; see [“Display OpenSSL Version”](#) on page 2 for instructions. If RiverWare is using the required version, you should be able to use the web service DMIs.
Note: This approach works by adding the ExternalDLLs folder path to the start of the PATH environment variable at run time. This means that the ExternalDLLs folder is searched for the DLLs before other locations in your PATH. This does not guarantee that it is the first location that is searched on the computer as Windows may locate versions of the DLLs in other locations first, such as in the windows\system32 folder.

Unzip the OpenSSL Download and Update Your User Path

Use this procedure to install the required version of OpenSSL if you are able to unzip files and modify your environment variables.

Caution: RiverWare requires OpenSSL 1.1.x, any patch level (1.1.1k, for example). Do not use any other version.

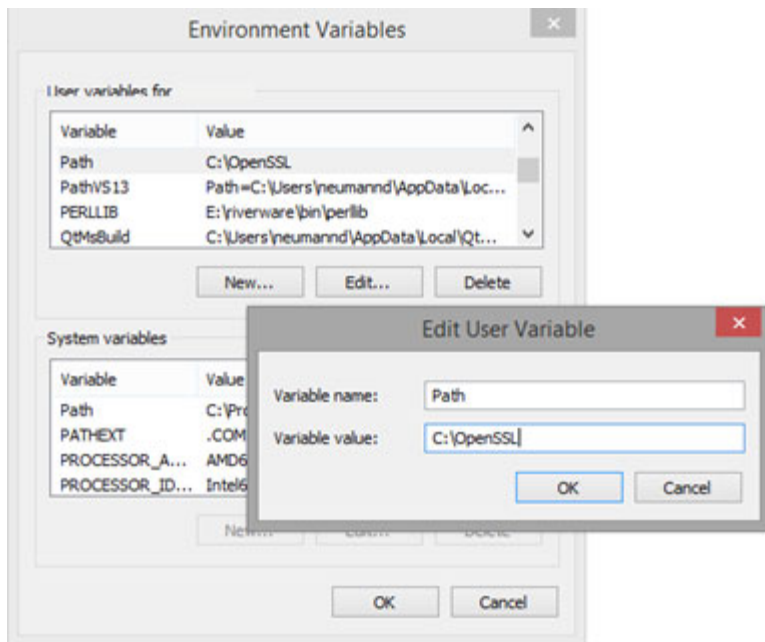
1. Find the correct download, either from the [OpenSSLWiki](#) or from a web search. For example:
openssl-1.1.1k.zip
2. Download the file to your computer.
3. Unzip the file to one of the following locations.
 - A folder in your System path. You may need Windows Administrator privileges to do this. For more information, on the System path, do a web search for: “what is the system path”
 - A new folder on your computer, such as: `C:\OpenSSL\`

Installing OpenSSL for the Web Service DMIs

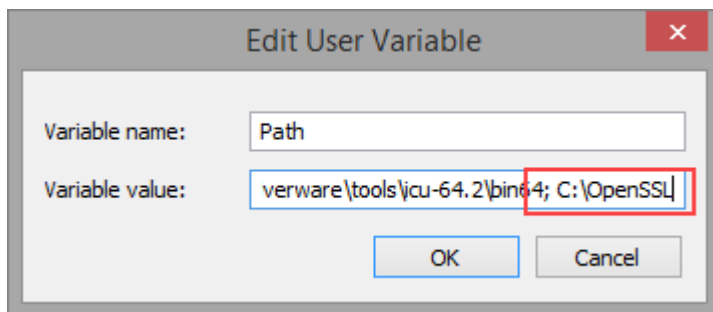
4. When the unzip is complete, verify that the target folder includes the following files:
 - openssl.exe—OpenSSL program
 - libcrypto-1_1-x64.dll
 - libssl-1_1-x64.dll
5. If you did not unzip the download to a folder in your System path, use the following steps to add the OpenSSL folder location to your Path user variable.

Note: These screen shots were made using Windows 8.1. For details on other Windows versions, do a web search for: “how to add user path in windows *N*”, where *N* is your version of Windows.

- a. Open the Environment Variables window.
- b. If the Path user variable does not already exist, create it and enter the location of your OpenSSL folder (full path) in the variable value.



- c. If the Path user variable already exists, append the location of your OpenSSL folder (full path) to the variable value, separated by a semi-colon.



6. Save your updates and close the Environment Variables window.

7. Verify RiverWare is now using the required version of OpenSSL; see [“Display OpenSSL Version”](#) on page 2 for instructions. If RiverWare is using the required version, you should be able to use the web service DMIs.

Run the OpenSSL Installer With Administrator Privileges

Use this procedure to install the required version of OpenSSL if you have Windows Administrator privileges and can run an installer executable.

Caution: RiverWare requires OpenSSL 1.1.1, any patch level (1.1.1k, for example). Do not use any other version.

1. Find the correct version of the OpenSSL installer, either from the OpenSSL Wiki or from a web search. For example:

Win64OpenSSL-1_1_1k.exe

2. Download the installer to your computer.
3. Run the installer as a user with Windows Administrator privileges.
4. When the installation is complete, verify that your system folder includes the following files:
 - openssl.exe—OpenSSL program
 - libcrypto-1_1-x64.dll
 - libssl-1_1-x64.dll
5. Verify RiverWare is now using the required version of OpenSSL; see [“Display OpenSSL Version”](#) on page 2 for instructions. If RiverWare is using the required version, you should be able to use the web service DMIs.

Installing OpenSSL for the Web Service DMIs