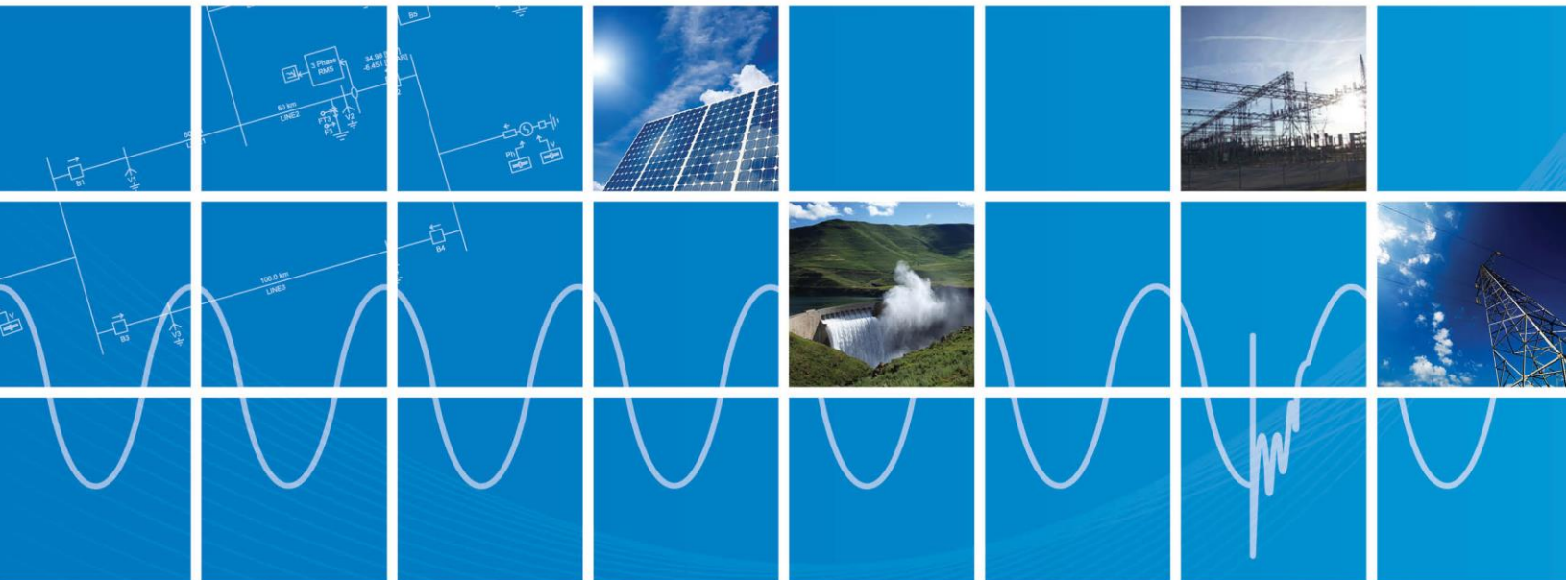


PSCAD™

Setting the SystemDefaultTlsVersions Registry Key to Enable TLS 1.2

September 15, 2021
Initial



Contents

1. SITUATION.....	1
2. POSSIBLE SOLUTION	1
3. ADVANTAGE OF EMPLOYING THIS SOLUTION.....	1
4. ADVANTAGES OF CERTIFICATE LICENSING OVER LOCK-BASED LICENSING	2
5. SOLUTIONS.....	2
OPTION 1 - USING THE FORTRAN MEDIC UTILITY HELP MENU	3
OPTION 2 - USING THE FORTRAN MEDIC UTILITY STATUS PANE.....	3
OPTION 3 - USING A SIMPLE BATCH FILE.....	5
OPTION 4 - USING A COMPLEX BATCH FILE	5

1. Situation

When using certificate licensing, and communicating with the Certificate License Manager, the following released products support the listed TLS protocols.

Software product	TLS versions supported
PSCAD 4.5.1 ...PSCAD 4.6.3 Update 3	TLS 1.0 only
PSCAD 4.6.3 Update 4	TLS 1.2 <i>but on some external clients, fail to negotiate TLS 1.2 and revert to using TLS 1.0.</i>
PSCAD 4.6.3 Update 5	
PSCAD 5.0.0 and better	
Enerplot 1.0.0	TLS 1.0 only
FACE 2.0.1	
PRSIM 1.0.0	TLS 1.2 <i>but on some external clients, fail to negotiate TLS 1.2 and revert to using TLS 1.0.</i>
PSCAD Initializer 1.0.0	

2. Possible Solution

While we were unable to re-create this issue in-house and resolve it, an external client who experienced this issue graciously informed us that PSCAD 4.6.3 Update 3 can use TLS 1.2 on their system if the following two registry keys are created:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\.NETFramework\v4.0.30319\
```

```
DWORD: SystemDefaultTlsVersions = 1
```

```
HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Microsoft\.NETFramework\v4.0.30319\
```

```
DWORD: SystemDefaultTlsVersions = 1
```

3. Advantage of Employing This Solution

With these registry changes, you should be able to use your existing PSCAD 4.6.3 Update 4, PSCAD 4.6.3 Update 5, PRSIM 1.0.0, or PSCAD Initializer 1.0.0, with TLS 1.2, without requiring a future release or update of PSCAD 4.6.3, PRSIM 1.0.0, or PSCAD Initializer 1.0.0.

4. Advantages of Certificate Licensing Over Lock-Based Licensing

Clients who use certificate licensing can launch multiple instances of PSCAD, each using the same license certificate. Clients who use lock-based licensing can only launch 1 instance of PSCAD for each lock-based license seat.

When using certificate licensing,

- you don't need to share a Sentinel USB security lock with other colleagues,
- you don't need to VPN into your corporate network to access your corporate lock-based License Manager
- you are not affected by the continuous VPN connectivity required to use the your corporate lock-based License Manager

5. Solutions

These registry changes can be:

- Done manually with the latest Fortran Medic Utility, released September 14, 2021 or later,
- Done manually via one of the batch files below,
- Automated over multiple machines via one of the batch files below, or
- Done manually via regedit. Please see your IT staff for instructions on how to use regedit.

If using the Fortran Medic Utility to create and set the registry keys,

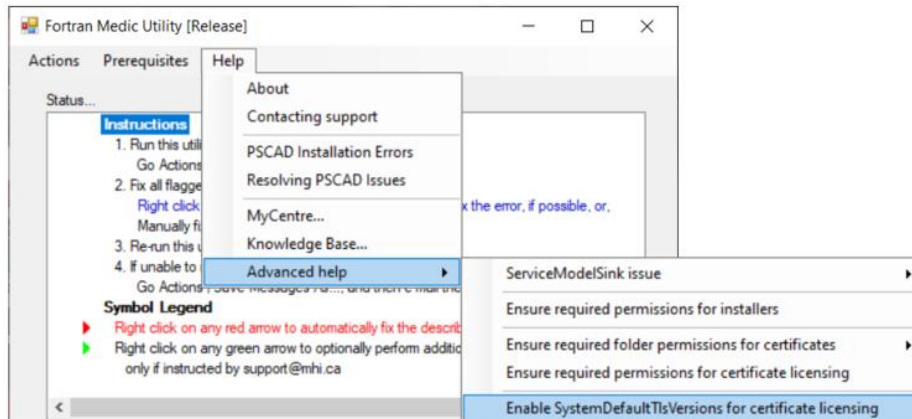
- You can always download the latest Fortran Medic from this URL:
<http://updater.pscad.com/utilities/FortranMedic.zip>
- Extract both files from the downloaded ZIP file

If using a batch file to set the registry keys,

- You must run the batch script inside an elevated command prompt, or
- You must elevate and run the batch file by right clicking on the batch file, select *Run as Administrator*

Option 1 - Using the Fortran Medic Utility Help Menu

- Launch the Fortran Medic Utility (Medic) with elevated rights by selecting the *fortranmedic.exe* file, then right-clicking it and selecting *Run as Administrator*.
- When the Medic displays, select *Help | Advanced help | Enable SystemDefaultTlsVersions* for certificate licensing as shown below.



- Select *OK* in the dialogs that follow.
- If everything succeeds, you should see something like the following:

Successfully set [32-bit registry]::SystemDefaultTlsVersions = 1

Successfully set [64-bit registry]::SystemDefaultTlsVersions = 1

If you ever need to reverse this, and disable the SystemDefaultTlsVersions registry keys, then

- Select *Help | Advanced help | Disable SystemDefaultTlsVersions*

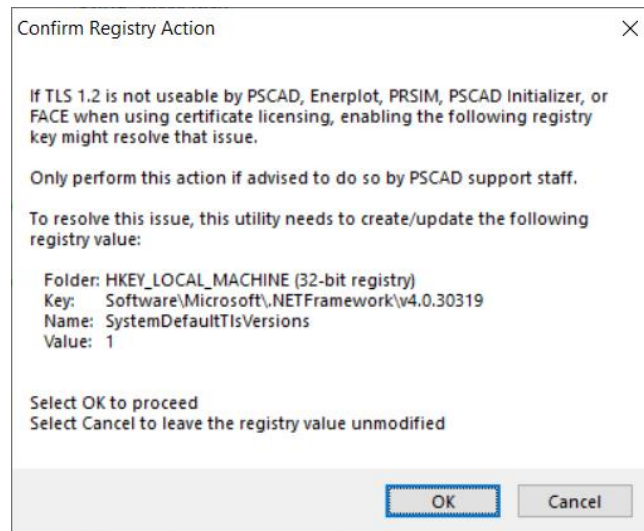
Option 2 - Using the Fortran Medic Utility Status Pane

- Launch the Fortran Medic Utility (Medic) with elevated rights by selecting the *fortranmedic.exe* file, then right clicking on it, and selecting *Run as Administrator*.
- When the Medic displays, select *Actions | Start*.
- When the Medic has finished displaying the information, scroll down to the *Network Information* section.

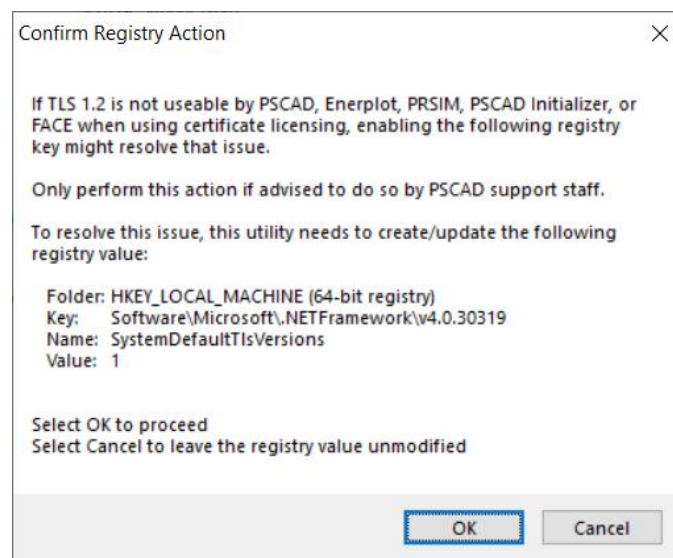
- d. If the registry value is missing, not created, not set, or set to be disabled, you should see messages similar to the following:

```
.NET v4.0.30319 (x86)
  SchUseStrongCrypto: 1
▶ SystemDefaultTlsVersions: 0
.NET v4.0.30319 (x64)
  SchUseStrongCrypto: 1
▶ SystemDefaultTlsVersions:
```

- e. If so, right-click on the first green symbol. When the dialog similar to the following displays, select *OK*:



- f. Right click on the second green symbol. When the dialog similar to the following displays, select *OK*:



Option 3 - Using a Simple Batch File

You can use the following simple batch file to set the two registry values. No error checking is performed in this example script.

```
reg add "HKLM\Software\Microsoft\.NETFramework\v4.0.30319" /reg:32 /v SystemDefaultTlsVersions /t REG_DWORD /d 1 /f
reg add "HKLM\Software\Microsoft\.NETFramework\v4.0.30319" /reg:64 /v SystemDefaultTlsVersions /t REG_DWORD /d 1 /f
```

Option 4 - Using a Complex Batch File

You can use the following more complex batch file below to set the two registry values. It will return:

- an exit code = 0 if both values were set
- an exit code = 1 if it failed to set either value

If it succeeds:

- You should see the following,

```
Setting SystemDefaultTlsVersions [32-bit registry]
The operation completed successfully.

Setting SystemDefaultTlsVersions [64-bit registry]
The operation completed successfully.

Successfully set both registry keys
```

- and %errorlevel% = 0 which can be tested by the invoker.

If it fails:

- You will most likely see something similar to the following,

```
Setting SystemDefaultTlsVersions [32-bit registry]
ERROR: Access is denied.
Failed to set key. Error = 1

Setting SystemDefaultTlsVersions [64-bit registry]
ERROR: Access is denied.
Failed to set key. Error = 1

Failed to set one or both registry keys
```

- and %errorlevel% = 1 which can be tested by the invoker.

The script is as follows:

```
@echo off
@cls
set anyerror=0

:part1
echo.
echo Setting SystemDefaultTlsVersions [32-bit registry]
reg add "HKLM\Software\Microsoft\NETFramework\v4.0.30319" /reg:32 /v SystemDefaultTlsVersions /t REG_DWORD /d 1 /f
if %errorlevel% == 0 goto part2
set anyerror=1
echo Failed to set key. Error = %errorlevel%

:part2
echo.
echo Setting SystemDefaultTlsVersions [64-bit registry]
reg add "HKLM\Software\Microsoft\NETFramework\v4.0.30319" /reg:64 /v SystemDefaultTlsVersions /t REG_DWORD /d 1 /f
if %errorlevel% == 0 goto done
set anyerror=1
echo Failed to set key. Error = %errorlevel%

:done
echo.
if "%anyerror%" == "1" goto errors
echo Successfully set both registry keys
exit /b 0

:errors
echo Failed to set one or both registry keys
exit /b 1
```


DOCUMENT TRACKING

Rev.	Description	Date
0	Initial	21/Sep/2021