# Using CSR Utility

One of the special security features of the SimpleLink™ Wi-Fi ® is the unique key-pair per device. This feature enables crypto utilities such as sign and verify, without requiring direct access to the private key of the device from the host application.

This unique key pair could also be used for mutual authentication in the TLS handshake. For that ability, it is not enough to have a unique key-pair for the device, but the device must have a certificate signed by an authority or chain of trust that is accepted by the server. To create this certificate, in most cases, access to the public key of the device is not enough. The common way to create and sign a certificate is to use certificate signing request (CSR), which requires a signature of some data with the private key during the creation.

Texas Instruments simplifies this process and provides a tool to get the CSR in PKCS #10 format generated internally by the device. This appendix describes how to get the CSR from the device and how to program the signed certificate.

## A.1 Get CSR From Device and Copy it to File

To create a csr file, use the get_csr.bat file. For Linux/mac os versions, use ./get_csr.sh.get_csr.* is a script that creates a project (according to device type), programs it to the device, and executes a CSR utility.

### A.1.1 Edit get_csr.bat

1. Set SDK path and service pack name.

```
set SDKINSTALLPATH=C:\ti\simplelink_cc32xx_sdk_1_60_00_04
rem *****
set SPNAME=sp_3.6.0.3_2.0.0.0_2.2.0.6.bin
set SP_PATH=%SDKINSTALLPATH%/tools/cc32xx_tools/servicepack-cc3x20
```

2. Set certificate list and signature.

```
rem Certificate store list/signature and path
set CERT_LST=certcatalogPlayGround20160911.lst
set CERT_LST_BIN=certcatalogPlayGround20160911.lst.signed_3220.bin
set CERT_LST_PATH="%SDKINSTALLPATH%/tools/cc32xx_tools/certificate-playground"
```

3. Set certificate and key names and path.

```
set DUMMY_CERT_NAME=dummy-root-ca-cert
set DUMMY_KEY_NAME=dummy-root-ca-cert-key
set DUMMY_CERT_PATH=%SDKINSTALLPATH%/tools/cc32xx_tools/certificate-playground
```

4. Set parameters to csr certificate.

```
26  rem Certificate serial number (up to  8 bytes)
27  set CERT_SERIAL_NUM=0111000
28  rem Validity period in days (> 0)
29  set VALIDITY=2
30  rem Is certificate CA? (0-No/1-Yes )
31  set ISCA=1
32  rem Subject country( 2 capital letters, i.e US)
33  set COUNTRY="US"
34  rem Subject state (max size is 64)
35  set STATE="State"
36  rem Subject locality (max size is 64)
37  set LOCALITY="Locality"
38  rem Subject surname (max size is 64)
39  set SURNAME="SURNAME"
40  rem Subject organization  (max size is 64)
41  set ORGANIZATION="Organization name"
42  rem Subject organization unit (max size is 64)
43  set ORG_UNIT="unit name"
44  rem Subject common name (max size is 64)
45  set NAME="Name"
46  rem Subject email (max size is 64)
47  set EMAIL="email@email.com"
```

5. Verify paths and parameters.
   From line 55 to line 122.
6. Set executables.

```
117  set RUNCMD=SLImageCreator.exe
118  set XDSRESET=xds110reset.exe
119  set CSREXE=csr.exe
```

7. Create a new ImageCreator project.

```
124  echo Creating New Project
125  %RUNCMD% -q project new --name %PROJNAME% --device %PROJDEVICE% --description "project for csr" --overwrite
126
```

8. Set ServicePack, certificates, and MCU image.
   From line 129 to line 145.
9. Program new project.

```
144 echo Program the image directly from the Project
145 if [%COMPORT%]==[] (
146     %RUNCMD% -q project program --name %PROJNAME%
147 ) else (
148     %RUNCMD% -q project program --port %COMPORT% --name %PROJNAME%
149 )
```

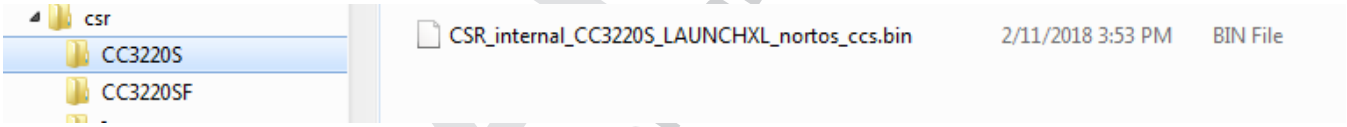
10. Reset device and wait 10 seconds.

```
153 echo.
154 echo.
155 echo sleep 10
156 echo.
157 timeout 10 >nul
158
159
160
161 echo.
162 echo reset device
163 echo.
164 %XDSRESET%
```

11. Run csr utility.

    After programming, the script executes the csr utility (csr.exe/csr, lines 176-186). This utility interacts with the device over RS232, and sends the inputs from the script for creating a csr.pem file at the output folder.

    The relevant mcu files exist in the CC3220S/SF and CC3235S/SF folders.




### A.1.2 Use get_csr.bat

Call to get_csr.bat:

Provide device type (CC3220SF/ CC3220S/ CC3235SF/ CC3235S)

```
sr>get_csr.bat CC3220SF
```

To avoid using auto detection for the com port, provide a com port as parameter, so that the call to get_csr.bat is:

```
sr>get_csr.bat CC3220SF COM13
```

## A.2 Replace CSR File in the Project

To replace or add a new csr.pem file, use the set_csr.bat (./set_csr.sh) file. This batch deletes old files from the project (if they exist) and adds a new one.

### A.2.1 Usage

```
set_csr <proj_name> <pem_file_name_in_the_project_file_system> <pem_file_source>
```

```
set_cert <proj_name> <pem_file_name_in_the_project_file_system> <pem_file_source>
```

```
>set_cert.bat CC3220SF_CSR_csr_new.pem C:\ImageCreator\CSR\Input\csr_new.pem
```

### A.2.2 Script Parameters

```
26  set PROJNAME=%1
27  set FILENAME=%2
28  set FILESOURCE=%3
29
```

### A.2.3 Delete Old User Files From the Project

```
39  echo.
40  echo Deleting old pem file from the project
41  echo.
42  %RUNCMD% -q project del_file  --name %PROJNAME% --file %FILENAME%
```

### A.2.4 Add New File

```
44  echo Adding csr file to the project
45  echo.
46  %RUNCMD% project add_file  --name %PROJNAME% --fs_path %FILENAME% --file %FILESOURCE%
47
```