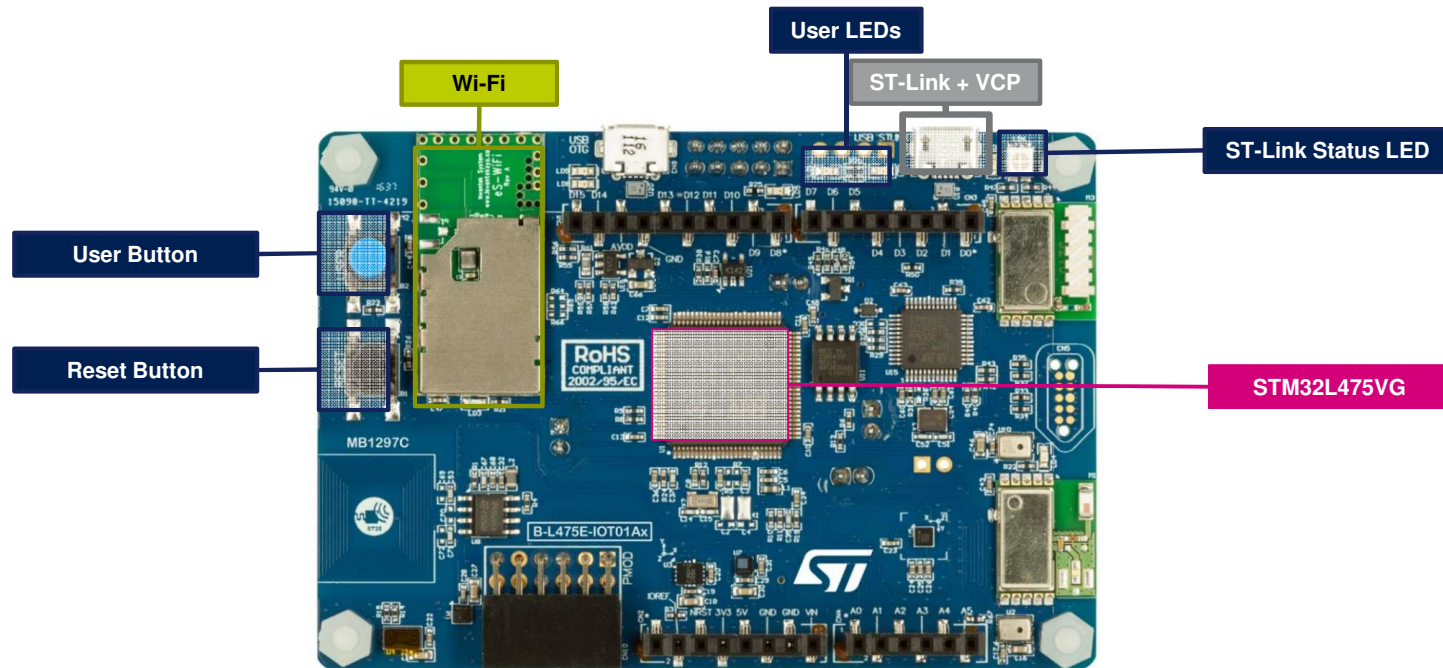


Lab 4: Connect to AWS IoT

STM32L475 Discovery IoT Node

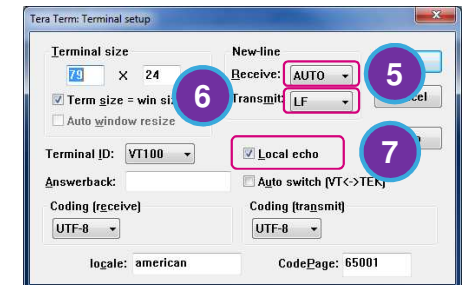
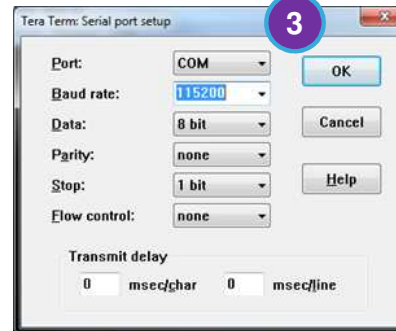
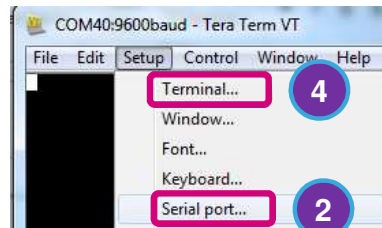
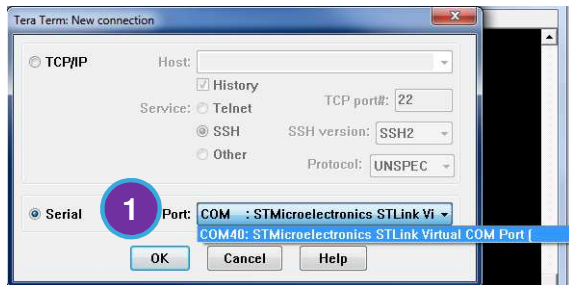
21



Tera Term Configuration

22

- First thing we need to configure Tera Term to communicate with ST-Link over the virtual com port. This will be used to configure the application and get debug information.
 1. Open Tera Term and Select the STMicroelectronics STLink Virtual COM Port and click OK,
 2. Open Setup->Serial port...,
 3. Set the Baud rate to 115200, 8 bit, Parity none, Stop 1 and Flow control none and click OK,
 4. Open Setup->Terminal...,
 5. Set New-Line Receive to AUTO,
 6. Set New-Line Transmit to LF,
 7. Enable Local echo,
 8. Click OK.




Open AWS_HandsOn Project

23

- Now we are going to configure the AWS firmware program to set the network SSID and password, set the AWS Certificates we just created and establish IoT MQTT connection.

1. Close the previous IAR project.

2. Double click on  **Project.eww** file located under

```
C:\STM32IoTDKCloudSeminar\Hands_On\BLE_and_Cloud\Projects\B-L475E-IOT01\Applications\Cloud\AWS\EWARM
```

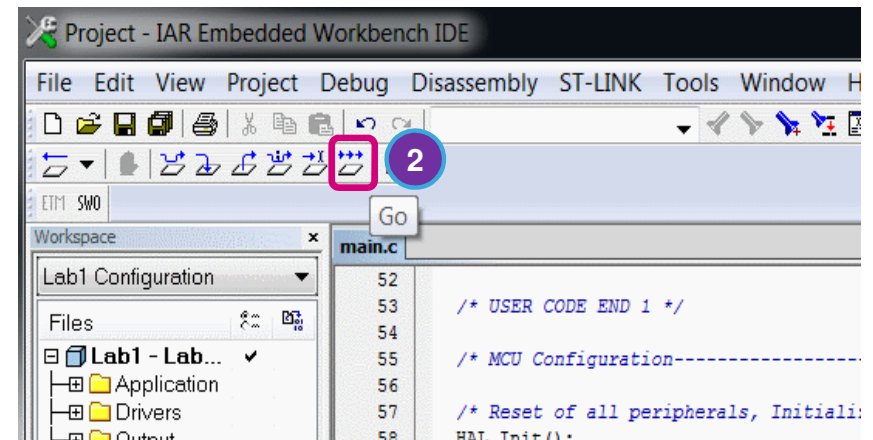
Load and Run

24

1. Click the GREEN ARROW to **Build** the Project, **Download** and start the **debugger**. (Ctrl + D),



2. Click the triple-arrow **GO** button! (F5),



3. Select the Tera-Term window,

Wi-Fi Configuration

25

1. Set your network SSID
2. Select your network security mode (Type 3 for the WPA2 Security mode)
3. Enter your network password

```
COM40 - Tera Term VT
File Edit Setup Control Window Help
*****
*** STM32 IoT Discovery kit for STM32L475/STM32F413/STM32F769 MCU ***
*** Cloud Connectivity Demonstration ***
*** FW version 1.0.0 - Mar 20 2017, 10:26:42 ***
*****

*** Board personalisation ***

Press the User button <Blue> within the next 5 seconds if you want to change the
configuration
<NetWork and AWS security credentials>

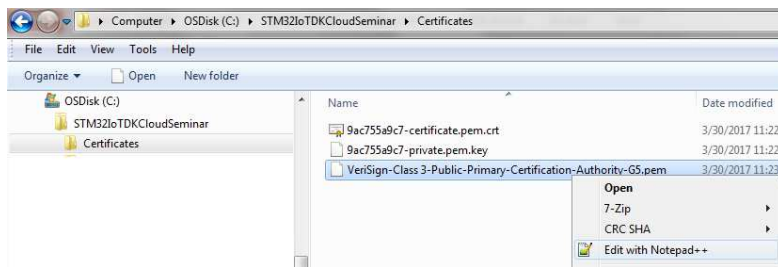
*** WIFI connection ***

Your WIFI parameters need to be entered to proceed
Enter SSID: STM32_DevConTraining 1
You have entered STM32_DevConTraining as the SSID.
Enter Security Mode <0 - Open, 1 - WEP, 2 - WPA, 3 - WPA2>:3 2
You have entered 3 as the security mode.
Enter password: stm32iot 3
```

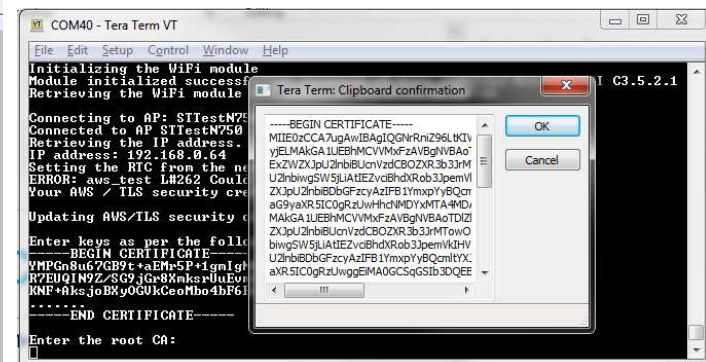
Set the Root-CA certificate

26

1. Open the VeriSign-Class 3-Public-Primary-Certification-Authority-G5.pem in a text editor,
2. Copy the certificate content (Ctrl + A, Ctrl + C),
3. Paste the certificate in Tera-Term (Click on the mouse right button. Do not use Ctrl + V) and click OK
4. Click Enter.



```
-----BEGIN CERTIFICATE-----
MIIE0zCCA7ugAwIBAgIQGnRni296LTKIVjNzGs78jANBgkqhkiG9w0BAQUFADCB
yIELMAkGA1UEBhMCVVMxZzAVBgNVBAsTDjI1cm1TaWduLWUwLWUwLWUwLWUwLWUw
Ex2WZjU2LnBiBUcnVzdCBOZXR3b3JrMTowOAYDVQQLEzEoYykgMjAwMjAwMjAw
ZXJpU2lnbiBDbGFzcyAIFB1YmVycmVzY291bnRpb2l1cm1TaWduLWUwLWUwLWUw
aG9yaXR5IC0gRzUwHhcNMjAwMjAwMjAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
MAkGA1UEBhMCVVMxZzAVBgNVBAsTDjI1cm1TaWduLWUwLWUwLWUwLWUwLWUwLWUw
ZXJpU2lnbiBDbGFzcyAIFB1YmVycmVzY291bnRpb2l1cm1TaWduLWUwLWUwLWUw
biwgSW5jLiAtIEZvciBhdXR3b3JrMTowOAYDVQQLEzEoYykgMjAwMjAwMjAw
U2lnbiBDbGFzcyAIFB1YmVycmVzY291bnRpb2l1cm1TaWduLWUwLWUwLWUwLWUw
aXR5IC0gRzUwHhcNMjAwMjAwMjAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAwMDAw
nmAMqudL007cflw8RRy7K+D+KQL5Vw1j2IUvJ/XxrcgxiV0i6CqppkKzj/15Vbex
t0uz/o9+B1fe70Pb2mIVYc9gDaTY3vjgw2IIPVQT60nKXV8FJuUrxuf6/WhkciZ
SdhDY2p89Kf6BRTdGJaXvHcPa3BJ023tdS1bT1r8VdGw9K118g8cmoy5fGg
BO+QueQASMD6tRn/Arz0P07gi+3i+2016zy9A9r911kTM2HRxay3qkSG9T2RT+
rCp8x4/7BbnkjWbN1Dxpg8v+R7Orfk/Fla40ndTq8Bnc+MUCh71P59zLMDRf10/
N1eWiu576OUVAgBMAAG5gblwga8wDwVf0R0TAQH/BAUwAEB/zaO8gVfVgQBAfE
BAMCAQYwbQYIKwYBQHAQwEYTBfV2gWzBZMPcwVRVJaW1h2Uv221mKCEwH2AH
BgUcDgMCgQYUj+XTGCaasjYsrw8+AatRIGCw7G84wJRYjaHR0cDovL2xv228udmVY
aXNp224uY29uL3I3Z2bG9nb3V5aWwWwHQYDVRS0BSVZFH/2zaFc3ey78DAJ8OM4+gKv
MzEzMA0GCQsgS1b3QEBBQUAA4IBAQCtJewX2LP2BqYL23q3ktvXf2pXki0O2E
p6B4Eq1dKvW2MXn12YtmAl+X6/WzCh18gGqCBpH3vn5fJJaCGkGdDk+bW48DW7Y
5gaRQB15+Mht39tBqCWIIMn2BU4gcmU7gKEKQeTb47EDN01AtukixLE0Kf6BWLK
WE9gyn6CagCqIUxobXbf+eE28qV1r2G316Bf0cmEmze/aicRm0hW0LXKn6iY2
4fQRbxCl1fxnQgUY286DUV4otp6F01vvpX1FQHKotw5Dgb7MzViCbidJ4vE2V8N
hnacRHr21Vz2XTIIM6RUthg/aFzyQkqFOFSXK9H0LFKaEdao7WNNq
-----END CERTIFICATE-----
```



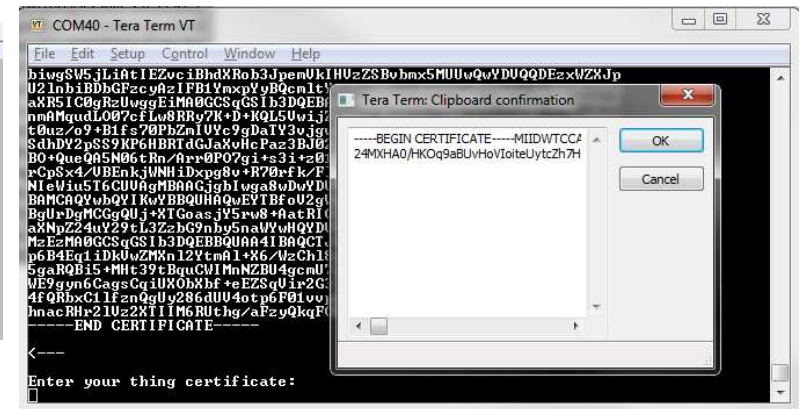
Set the Thing Certificate

27

1. Open your xxxx-certificate.pem.crt in a text editor
2. Copy the certificate content (Ctrl +A, Ctrl + C),
3. Paste the certificate in Tera-Term (Click on the mouse right button. Do not use Ctrl + V) and click OK,



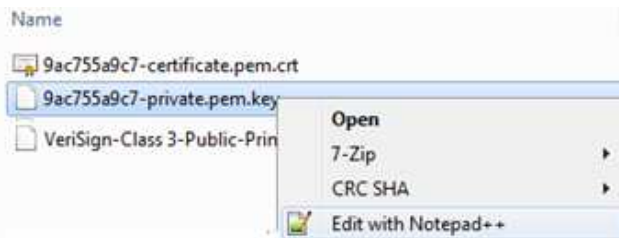
```
1 -----BEGIN CERTIFICATE-----
2 MIIDWTCCAKGgAwIBAgIUlmpptzDKgNrThwRkfk+nwvC2vTQwDQYJKoZIhvcNAQEL
3 BQAwTTFMEkGA1UECwQWlhem9uIFdlYiBTZXJ2aWN1cyBFPFUtYXpvc15jb20g
4 SW5jLiBMPVNIYXR0bGU0Q9V2FzaGlu23Rvb1BDVVVtYm40XDE3MDMzMDU0MTYz
5 OVoXDTQ5MTIzMTIzNTk1OVowhjEcmBoGA1UEAwVQYVdtIElvcyB0b20wY2pY2F0
6 ZTCCASIwDQYJKoZIhvcNAQEBBQADggEPADCCAQoCggEBANuMaFan91IvGP+J0nh
7 lUmt5QY8YQk35bq3IceR/gVMz9RwjE1BLWcBs7ywj0K6YIGNBLaYXzXmCzKsIXE1
8 Fonc/FcMhQ1st1L3WeiG4oIbOMsJlighOLor0ciGx6AJctpwSuf7hBLNmYqLrZoo
9 nmqFYH2GjxueU0qDMH83jqL2KLNFEKJUetdbOMTfpeGepnMa3/oP9V902xPC9+7m
10 IcJr0QZ/Bw6WaEPNUCMIEN2lrcU7j4n6jIxKXxc/hrBpFI2UFlwFLI7MpvA/SFL
11 WvAuoG6cKeps/Xqisq5YMHk7jukxtsQgwH1JWxps/Ily5pthuq9+eqWynucvKfk
12 9iMCAwEAAANgMF4wHwYDVROjBBgwFoAU6859Hr0wfr2rFHYirmg8Xp4Eok4wHQYD
13 VR0OBByEFCzmbF0SOHnMoAOfIFU6BkWUibGMAwGA1UdEwEB/wQCMAAwDgYDVROj
14 AQH/BAQDAGEAMAOGCSqGSIb3DQEBCwUAA4IBAQBMSheCmqhgICrbn4M33XWLYC7B
15 wLxiEjnn2v9FaGyF5NOHd1iDfRNBCL3X9ezK3qStBEsCpvpFu290Tha4X5C+oUq
16 +lXGeeN3Sj/LxJc6KPU35BAYJaPbsUa3roJbvGR1bATPSktkZx5tA3WfMGdBC/
17 C4P26nFvz59W2HkdMcKk124MXHA0/HKQ99aBUvHoVioiteUytC2h7HouPNS8EY2xe
18 TovF78+tR8FbDE9ztRgjyGxjH3qXqKJifHvnj9oX2eCoiAkLa23PFU12910p
19 J//U61265FYUCKrvnAq863/E8rXPPdLX1R5MAw+oBBGYUpeVoEu9cIetE4
20 -----END CERTIFICATE-----
```



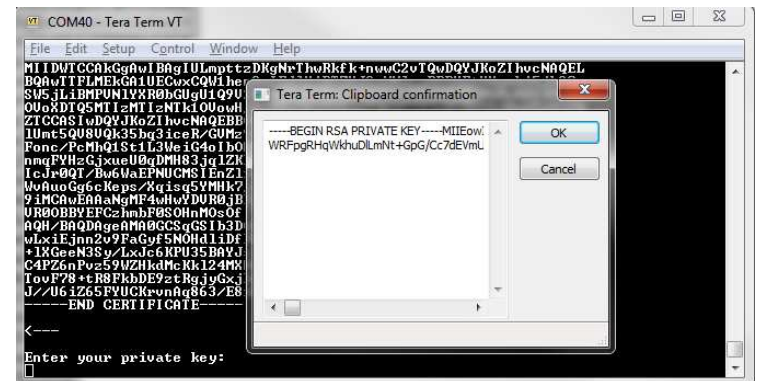
Set the Private Key

28

1. Open your xxxx-private.pem.key in a text editor
2. Copy the certificate content (Ctrl +A, Ctrl + C)
3. Paste the certificate in Tera-Term (Click on the mouse right button. Do not use Ctrl + V) and click OK



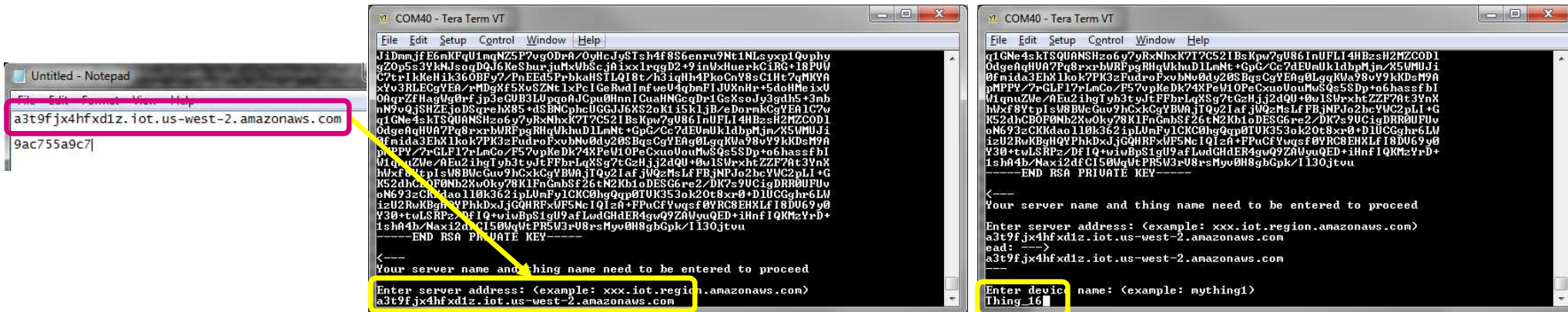
```
-----BEGIN RSA PRIVATE KEY-----
MIIEowIBAAKCAQEAk24x08CF2U18Y/4nSeGV8a3lBXxVCTflureJx5H82UzF1HCM
SUEtagGzvLCPQrpgiBYEtrJfNeYLMqwhcTUWidz89wyFDVK3Uvd26Ibighs4xKOW
KqE4uiRyKDH0AlY2nBK5/uEeta2ioutmg6eaoVgfMaPG5TS0MwfeOqVkos18Q
o1R6l1vQxN+1426mcxrf+g/1X3RnE8L37uYhwmvRBP8HDpZ0Q81QIXIg8dmWtTu
PifqMjEpdz+GsGKuj2QXKAUajeym8D9Iuta8C6gaDwp6mz9eqKyr1gweTu06TG
2xcDAfU1bGmz8iXlmm2G6r356pbFe5y8p+T2iWIDAQABoIBAC1Eq2NJQu5r1bb
Q/8IeAlejrlHgWjKNAzH7FNN/PyxwCLPyBN6ItKo4Sjv6B0qExfWau6CCIAJ0aj+
d2pGTbx2EYdd3cDAhC/CaWkfFM9MqnaGa829KGjppY177K+0FwMBdc6TSPNr10tW
JiDmmjFE6mKFqUlmqN25F7vgoDrA/OyHcJyStsh4f886enru9Nt1NLSyxp1Qvphy
g2Op53YkNJsogDQJ6Ke8burjuMxWbScjAixxlrggD2+9inWxHuerkCiRG+18FVW
C7trIkKeHik360BFy7/PnEed5PrbkaHSTLQI8t/h3iqRh4PkoCnY8eC1Ht7qMKYA
xyv3RLECGYEA/rMDgXf5Xvs2Nt1xPcIGeRwdImfweV4qbmFIJvXnHr+5dohMeixV
OAqr2fHagWg0rfj3eGV83LVPqoAJCpu0HnnICuaHNGcgDr1GeXaoJy3gdh5+3mb
nN9vQjSH2Ej0d8qrehX85+dSBNCphcUGGJJCX82oK1i5kljB/eDormkCgYEALC7w
q1GNe4skTSQUANSHzo6y7YRkNhxK7T7C52IBsKpw7gV86InUFLI4HBzH2M2COD1
OdgeAqHVA7Pq8rxrWRFPgRHqWkhudLmNt+GpG/Cc7dEVmUklbpmjm/X5WMUJi
0fmda3EhX1kok7PK3zFudroFxbvNv0dy208BqsCgYEAgOLgqKwa98vY9kKdSm9A
pMPFY/7rGLF17rLmCo/F57vpReDk74XPeW10PeCkuoVouMwSqa5SDp+o6haasfbI
W1qnuZWe/AEu2ihgTyb3tyJtFFbRlQK8g7tGzHj2dQU+0w1SWxht2ZF7At3YnX
hWxf8YcpisW8BwoGuv9hCckCgYBWAjTQy2IafjWQzMaLFPBjNPJo2bcYWC2PL+G
K52dhCBOP0Nb2XwOkY78K1Fngmb8f26N2Kb1DES6ge2r/DK7s9VCjDRR0UFUv
oN693cCKKdaol10k362ipLvmFylCK0hgQqpOTVK353ok20t8xr0+D1UCgqr6LW
IzU2RwKBgHQYPhDxkUjGQHfKwF5NcIQIzA+FPuCFYwgsFOYRC8EHKLfEDV69yD
Y30+twLSRPz/DfIQ+wlwBsp1gU9afLwGhdER4gwQ92AWyuQED+1HnFIQRMzYrd+
1shA4b/Naxi2dFCT5WgntFR5W3zV8rsMyv0H8gbGpk/I130jtvtu
-----END RSA PRIVATE KEY-----
```



Set the Server and Thing names

29

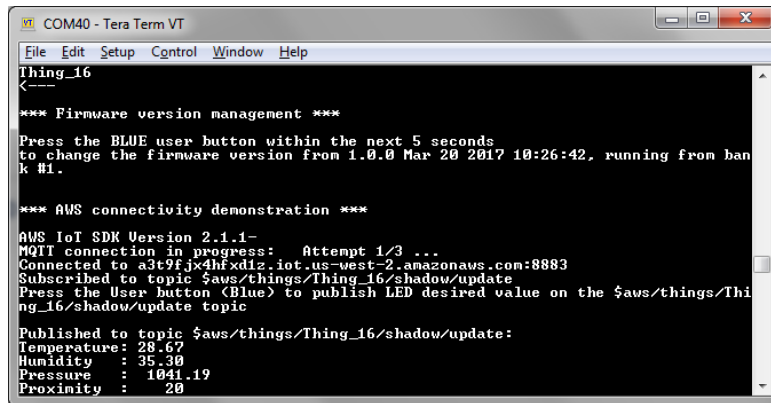
1. Copy the server address from the text file and paste it to Tera-Term then press Enter
2. Set your device name (The same as in slide 6).



Send data to AWS

30

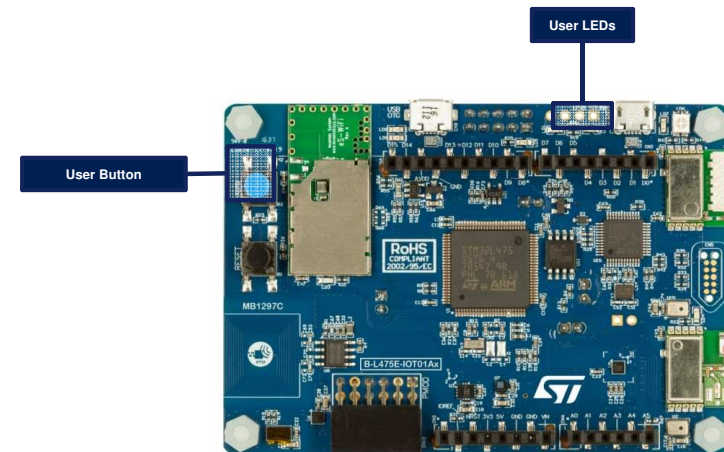
- The board will start sending sensor data once it is connected to AWS (every 10s for 10mn).
- Press the user button (the blue button) and the board send/receive LED messages to/from AWS IoT.
- The LED on your board will toggle every time the LED message is received.



```
COM40 - Tera Term VT
File Edit Setup Control Window Help
Thing_16
<---
*** Firmware version management ***
Press the BLUE user button within the next 5 seconds
to change the firmware version from 1.0.0 Mar 20 2017 10:26:42, running from ban
k #1.

*** AWS connectivity demonstration ***
AWS IoT SDK Version 2.1.1-
MQTT connection in progress: Attempt 1/3 ...
Connected to a3t9fjx4hfxdiz.iot.us-west-2.amazonaws.com:8883
Subscribed to topic $aws/things/Thing_16/shadow/update
Press the User button (Blue) to publish LED desired value on the $aws/things/Thi
ng_16/shadow/update topic

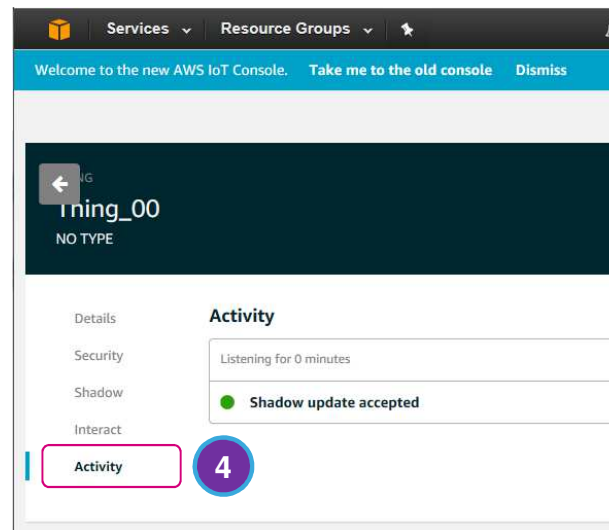
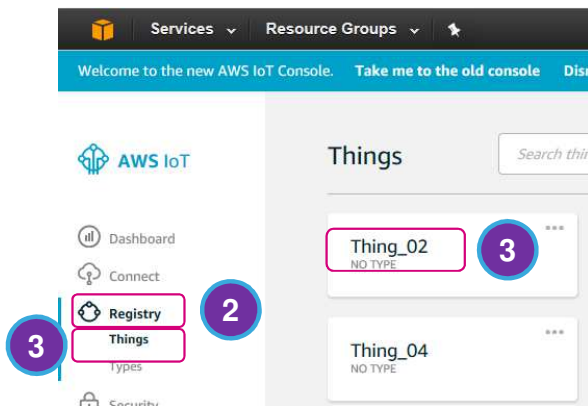
Published to topic $aws/things/Thing_16/shadow/update:
Temperature: 28.67
Humidity : 35.30
Pressure : 1041.19
Proximity : 20
```



Monitor Your Thing Activity

31

1. Select the AWS Console on your browser,
2. Select Registry,
3. Select Things then select your Thing,
4. Click on Activity,



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33



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