MQTT Bridge Configuration for Integration with an External LoRaServer

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1. LoRaServer instance and Gateway configuration

Refer to the following link for instructions on how to download and install LoRaServer: https://www.loraserver.io/

Add your Gateway (with its corresponding EUI) to LoRaServer.

2. Configure the Mosquitto TLS

2.1 Generated the Certificate

We recommend you use the script from the link below to generate the Certification and Key pair:

generate_CA.sh

In the command line window, execute the following commands:

Switch to the *root user*
Switch to the user's *root directory*
Download the *generate_CA.zip* file from the link
Unzip the *generate_CA.zip file*
Grant executable rights for *Generate_CA.sh*

```
su root
cd ~
wget http://docs.rakwireless.com/en/LoRa/Indoor-Gateway-RAK7258/Firmware/generate_CA.zip
unzip generate_CA.zip
chmod +x generate_CA.sh
```

Step 1. Generate the CA Certificate and the Certificate for the Mosquitto Server

```
./generate_CA.sh server
```

Step 2. Generate the TLS Certificate and Key for the LoRa Network Server (NS)

```
./generate_CA.sh client loraserver
```

Step 3. Generate the TLS Certificate and Key for the LoRa Application Server (AS)

```
./generate_CA.sh client loraappserver
```

Step 4. Generate the TLS Certificate and Key for the Client (Gateway)

Note: Replace xxxxxxxxxxxxxxxx with your LoRa Gateway EUI

```
./generate_CA.sh client eui_xxxxxxxxxxxxxxxx
```

2.2 Configure Mosquitto

Step 1. Copy the CA Certificate and the Server Certificate and Key to the directory */etc/mosquitto/certs*

```
Sudo cp ~/ca.* server.* /etc/mosquitto/certs
```

Step 2. Edit */etc/mosquitto/mosquitto.conf* adding the following code:

```
port 8883
cafile /etc/mosquitto/certs/ca.crt
certfile /etc/mosquitto/certs/server.crt
keyfile /etc/mosquitto/certs/server.key
require_certificate true
tls_version tlsv1
```

Step 3. Restart the mosquitto service

```
systemctl restart mosquitto
```

2.3 Configure LoRa Server

Step 1. Copy the CA Certificateand Key for the loraserver to */etc/loraserver*

```
cp ~/loraserver.* /etc/loraserver
cp ~/ca.crt /etc/loraserver
```

Step 2. Edit the file *network_server.gateway.backend* located in */etc/loraserver/loraserver.toml*

Note: Only the relevant section of the file are shown and the lines to be edited are in red. The rest of the file has been omitted in order to keep posterity. Please only edit the lines in red and leave the rest of the file as it is!

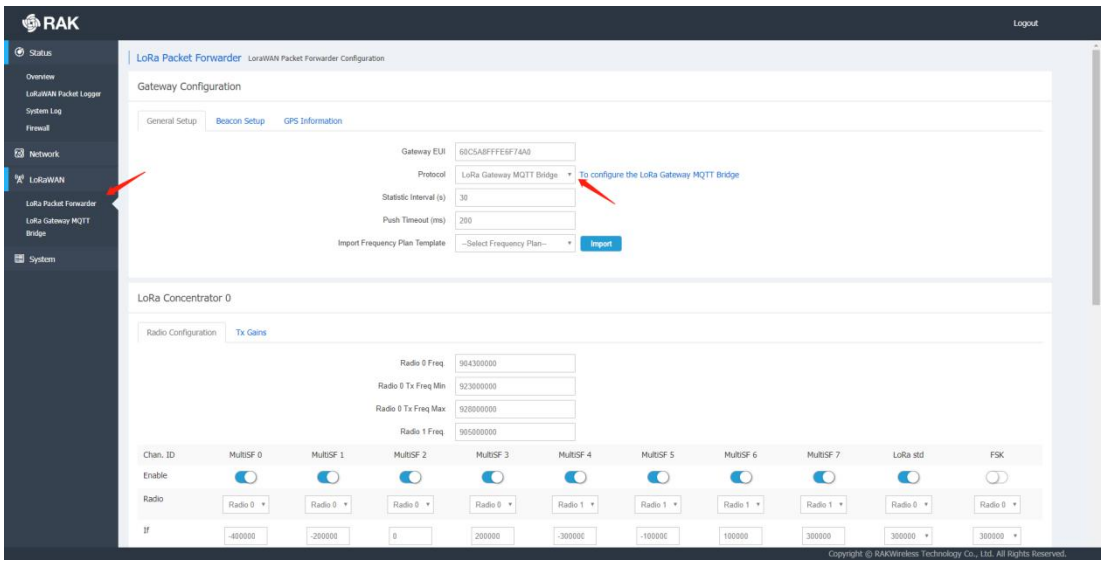
```
.....
.....
.....

    # MQTT server (e.g. scheme://host:port where scheme is tcp, ssl or ws)
    server="ssl://127.0.0.1:8883"

    # Connect with the given username (optional)
    username=""

    # Connect with the given password (optional)
    password=""

.....
.....
.....

    # CA certificate file (optional)
    #
    # Use this when setting up a secure connection (when server uses ssl://...)
    # but the certificate used by the server is not trusted by any CA certificate
    # on the server (e.g. when self generated).
    ca_cert="/etc/loraserver/ca.crt"

    # TLS certificate file (optional)
    tls_cert="/etc/loraserver/loraserver.crt"

.....
.....
.....
```

Step 3. Restart the loraserver service

```
systemctl restart loraserver
```

2.4 Configure the LoRaWAN Gateway

Step 1. Configure the LoRa Packet Forwarder Protocol to LoRa Gateway MQTT Bridge in the LoRa Gateway Tab in the Gateway Web UI:



Step 2. Configure the LoRa Gateway MQTT Bridge

Edit the MQTT Broker Address/Port

Enable User Authentication

Enter the Username/Password if you input those in the *loraserver.toml*

Select self-signed server & client certificate for the SSL/TLS Mode

Choose the TLS Version (TLSv1)

Copy the content of *~/ca.crt* in server to CA Certificate

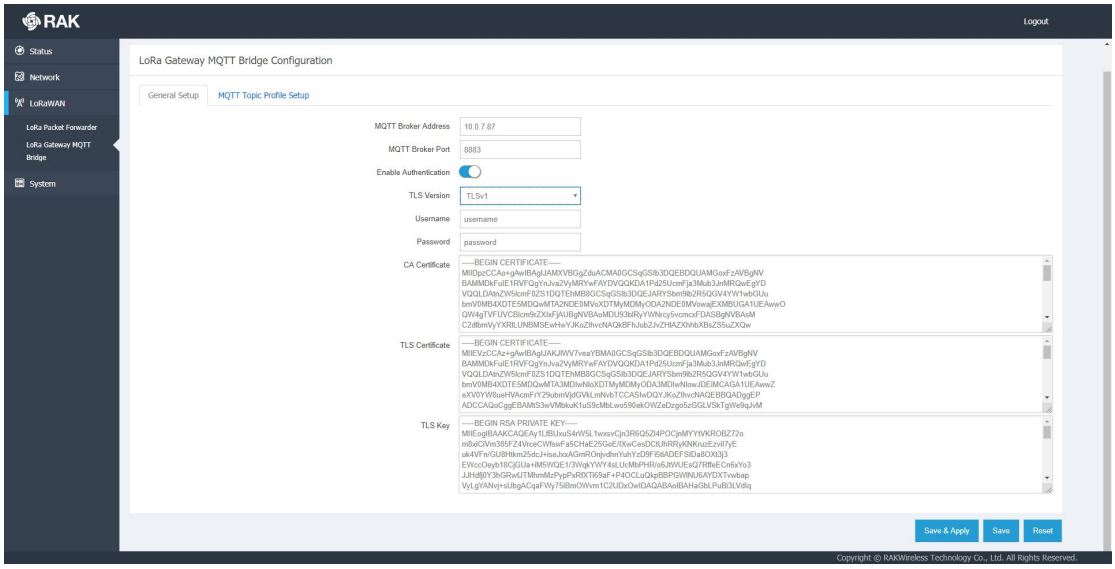
Copy content of ~/eui_xxxxxxxxxxxxxxxx.crt to TLS Certificate

Copy content of ~/eui_ xxxxxxxxxxxxxxxx.key to TLS Key

Enter the Client Key Passphrase

Save & Apply

Note: xxxxxxxxxxxxxxxx stands for your Gateway EUI



2.5 Subscribe to the MQTT topic where the Gateway is publishing via the Mosquitto commands

```
mosquitto_sub -t "gateway/#" -p 8883 -v --cafile ~/ca.crt --cert ~/eui_xxxxxxxxxxxxxxxx.crt --key eui_ xxxxxxxxxxxxxxxx.key --tls-version tlsv1
```

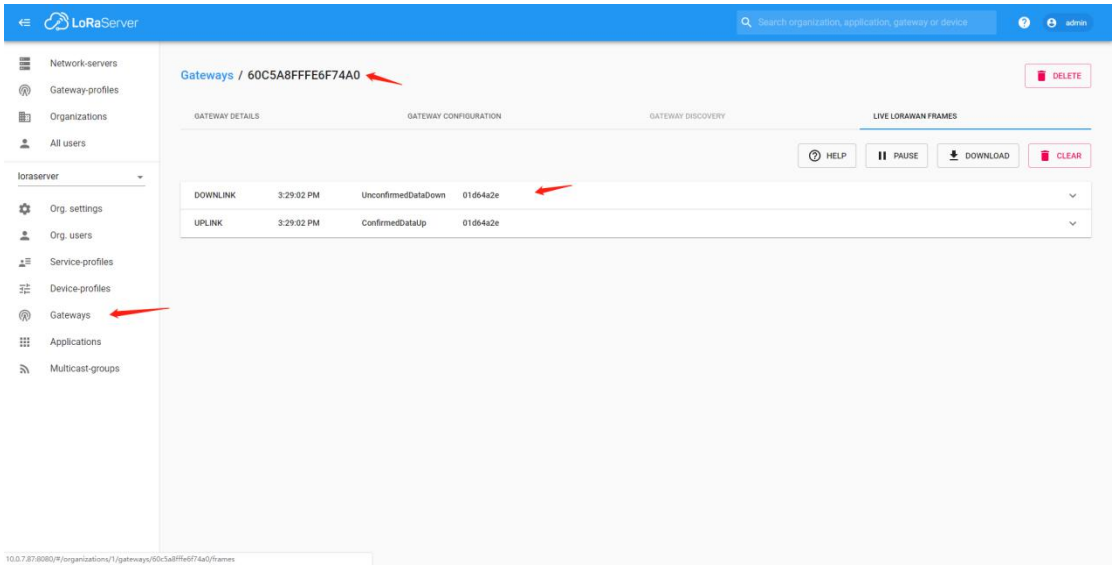
Note: xxxxxxxxxxxxxxxx stands for your Gateway EUI

If the following message appear, this means you have subscribed successfully

```
gateway/60c5a8fffe6f74a0/rx
{"rxInfo":{"mac":"60c5a8fffe6f74a0","timestamp":2036224996,"frequency":905300000,"channel":7,"rfChain":1,"crcStatus":1,"codeRate":"4/5","rssi":-23,"loRaSNR":10.5,"size":24,"dataRate":{"modulation":"LORA","spreadFactor":7,"bandwidth":125},"board":0,"antenna":0},"phyPayload":"gC5K1gGASwIFAUrhF/nr2MDyWNXIw9L4"}
gateway/60c5a8fffe6f74a0/tx
{"token":35594,"txInfo":{"mac":"60c5a8fffe6f74a0","immediately":false,"timestamp":2037224996,"frequency":927500000,"power":20,"dataRate":{"modulation":"LORA","spreadFactor":7,"bandwidth":500},"codeRate":"4/5","iPol":true,"board":0,"antenna":0},"phyPayload":"YC5K1gGgOQI9VpIf"}
gateway/60c5a8fffe6f74a0/ack {"mac":"60c5a8fffe6f74a0","token":35594}
gateway/60c5a8fffe6f74a0/stat
{"mac":"60c5a8fffe6f74a0","time":"2019-04-02T07:18:54Z","rxPacketsReceived":5,"rxPacketsReceivedOK":3,"txPacketsReceived":3,"txPacketsEmitted":3}
gateway/60c5a8fffe6f74a0/rx
{"rxInfo":{"mac":"60c5a8fffe6f74a0","timestamp":2046166763,"frequency":904100000,"channel":1,"rfChain":0,"crcStatus":1,"codeRate":"4/5","rssi":-21,"loRaSNR":9.8,"size":17,"dataRate":{"modulation":"LORA","spreadFactor":7,"bandwidth":125},"board":0,"antenna":0},"phyPayload":"gC5K1gGATAID1VoTFGxWaz8="}
gateway/60c5a8fffe6f74a0/tx
{"token":19073,"txInfo":{"mac":"60c5a8fffe6f74a0","immediately":false,"timestamp":2047166763,"frequency":923900000,"power":20,"dataRate":{"modulation":"LORA","spreadFactor":7,"bandwidth":500},"codeRate":"4/5","iPol":true,"board":0,"antenna":0},"phyPayload":"YC5K1gGgOgLJfJ+g"}
gateway/60c5a8fffe6f74a0/ack {"mac":"60c5a8fffe6f74a0","token":19073}
```

2.6 Check if you can see the packets in LoRaServer

Go to the Gateways tab of your LoRa Server Web UI, select your gateway and go to the LIVE LORAWAN Frames tab. You should see the packets in real time.



3. Revision History

Revision	Description	Date
1.0	Initial version	2019-06-20
1.1	Modify the layout	2019-06-21

4. Document Summary

Prepared by	Checked by	Approved by
Vladislav	Penn	