MQTT on the Raspberry Pi
How to setup the Mosquitto Broker

1. Setup MQTT on a Pi

This docu details the **setup of MQTT** on a Raspberry Pi.

Before you attempt this make sure that the Raspberry Pi can connect you your local LAN (cable or wireless) and that you have SSH enabled on the Pi. You should also be able to login to your Pi from a terminal window on your Windows PC or Mac. Furthermore you need to be able to run a File Transfer program on your home computer - to transfer Python files to your Pi.
I always use the free FileZilla FTP to do this.
FileZilla on the Net

Show installed packages on the pi:

```
dpkg -l
```

Step 1

Check the size of the partition on the SD card. Should be using the whole card.

```
df -h
```

Step 2
Make sure you have the new list of packages

```
sudo apt-get update
```

Step 3

If you have a Pi with the **full Pi OS** installed, go to step4. If, however, your Pi runs an **OS Lite** you need to install a few packages first.

```
sudo apt install python3-pip
sudo apt install git
pip3 install Rpi.GPIO
```

Step 4
Change to the Home-Dir of user pi, then clone the code from the GitHub Repository with this command:

```
git clone https://github.com/dakota127/python_stuff.git
```

After that you will find the code in the folder python_stuff.

Step 5

Mosquitto might already be on your pi. Go through these steps anyway.
Install the mosquitto MQTT broker on the pi, does not harm if already installed

```
sudo apt install -y mosquitto mosquitto-clients
```

or try this

```
sudo apt-get install mosquitto mosquitto-clients
```

(takes about 5 minutes)

Step 6

After installation the broker is configured (default config file) to allow **any** client in the LAN to connect. The line **allow_anonymous true** in the default config file specifies this**.**
Mosquittos config file is here, **never modify this file**

```
/etc/mosquitto/mosquitto.conf
```

Continue with step 7 if you do **NOT** want mqtt authentication for clients (recommended for beginners). You can add restrictions later by adding a user config file.

How to add a user config file:

Create a user config file for mosquitto, description here
https://mosquitto.org/man/mosquitto-conf-5.html

Fortunately you already have one, check supplied folder **mosquitto_config -** there you will find three files

- my_mosquitto.conf   private config file for mosquitto

- my_mqtt_password.txt   password file for mosquitto

- setup_mqtt.ch   shellscript to copy these file to the right place on the pi, see below

Note

Never change the **original** mosquitto config file which is here:

```
/etc/mosquitto/mosquitto.conf
```

Mosquitto always looks into the folder /etc/mosquitto/conf.d/ for a additional user config file. Any file found there (no matter what the file name) is considered to be a user config file.
So we place our user config file into this folder.

Here is how to go about this:i:
FTP the folder **mosquitto_config** to the home dir of user pi, change to this folder and execute the shellscript using :

```
sudo ./setup_mqtt.sh
```

Now the two files are in the correct place on the pi. In addition the scripts calls a utility (supplied with mosquito) to encrypt the password file.

You can look at the encrypted password file using (do NOT change anything)

```
sudo nano /etc/mosquitto/my_mqtt_password.txt
```

Note
If you want to run mosquitto with **no** authorization simply remove the user configfile using

```
sudo rm -f /etc/mosquitto/conf.d/my_mosquitto.conf
```

Step 7
Enable services for mosquitto (autostart after boot pi)

```
sudo systemctl enable mosquitto.service
```

Step 8
Check mosquitto with:

```
sudo mosquitto -v  -c /etc/mosquitto/mosquitto.conf
```

Step 9

Use these commands to Start/Stop/Restart mosquitto

```
sudo service mosquitto start
sudo service mosquitto stop
sudo service mosquitto restart
```

Check if the port is active

```
netstat -tln | grep 1883
```

Maybe check if the process is actually running

```
ps -ef | grep mosq
```

Query status with this

```
sudo service mosquitto status
```

Check the log file in case of problems

```
tail /var/log/mosquitto/mosquitto.log
```

Step 10

Get the IP-Adr of your Pi

```
hostname -I
```

Step 11

Test mosquitto with pub and sub **utilities** (provided with mosquitto install), **use your own IP-address** !
Open **two** terminal windows, login to the pi and use these commands.

```
mosquitto_sub -h 192.168.1.13 -p 1883 -v -t test

mosquitto_pub -h 192.168.1.13 -p 1883 -t test -m "Hello world"
```

Links:

https://iotbytes.wordpress.com/mosquitto-mqtt-broker-on-raspberry-pi/

http://www.steves-internet-guide.com/mosquitto-logging/

https://learn.adafruit.com/diy-esp8266-home-security-with-lua-and-mqtt/configuring-mqtt-on-the-raspberry-pi

here is another video explaining the setup

Video on YouTube

2.   Running the demo programs

Read the docu mqtt_demo.pdf in this folder.

Also check out this video for a setup with MQTT and SQL Lite on a **Pi Zero**. It is amazing what this litte machine can do.
Andreas Spiess Pi Zero

Also checkout my webpages:

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Projects Page

YouTube Channel

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