Mqtt protocol with esp32 lab installation

Requirements

      Mosquitto broker.
      Arduino ide.
      Mqtt client dashboard on both pc and mobile.

Downloads

- https://mosquitto.org/download/ from this link download the mosquitto broker for windows.
- https://www.arduino.cc/en/software from this link you can download the arduino ide for windows.
- http://mqtt-explorer.com/ from here you can get mqtt explorer for pc which act as client.

Installations

- To install mosquitto follow the steps and install the broker. Now broker is ready.
- Follow the installation steps for mqtt explorer and make it ready.

Steps to configure mosquitto

- Open the mosquitto config file and do the following to listen to the port number 1883.
  listener 1883
- For giving client id authentication you can give the client name to this eg. **clientid prefixes CL_ID**.
  clientid_prefixes _____

```
# clientid will be allowed to connect to the broker. By default,
# all clients may connect.
# For example, setting "secure-" here would mean a client "secure-
# client" could connect but another with clientid "mqtt" couldn't.
clientid_prefixes CL_ID
```

- To enable client authentication using credentials, you also need to set **allow_anonymous** parameter to false in mosquitto.conf file.
  allow_anonymous false
- To create a password file, the mosquitto broker comes with mosquitto_passwd utility which creates a password file. To create the user name and password "**mosquitto_passwd -c passwordfile username**" the it ask for password and give.Make the password to be hash by this command **"mosquitto_passwd -U passwordfile"** In the mosquitto config file give the path of our password file. Then start the mosquitto broker.
  password_file C:\Programfile\mosquitto\passwordfile

```
# Defaults to false, unless there are no listeners defined in the configuration
# file, in which case it is set to true, but connections are only allowed from
# the local machine.
allow_anonymous false


# -------------------------------------------------------------------
# Default authentication and topic access control
# -------------------------------------------------------------------


# Control access to the broker using a password file. This file can be
# generated using the mosquitto_passwd utility. If TLS support is not compiled
# into mosquitto (it is recommended that TLS support should be included) then
# plain text passwords are used, in which case the file should be a text file
# with lines in the format:
# username:password
# The password (and colon) may be omitted if desired, although this
# offers very little in the way of security.
#
# See the TLS client require_certificate and use_identity_as_username options
# for alternative authentication options. If an auth_plugin is used as well as
# password_file, the auth_plugin check will be made first.
password_file C:\Mosquitto\passwd.txt
```

- Open the command prompt and give the command to start the broker.
  mosquitto -c mosquitto.conf -v
- Now broker will start to run.
- Open one more command prompt in administration mode then try to establish the connection
  Mosquitto_sub -d -t topic -u username -P password
        OR
- From mqtt explorer also you can connect to the broker
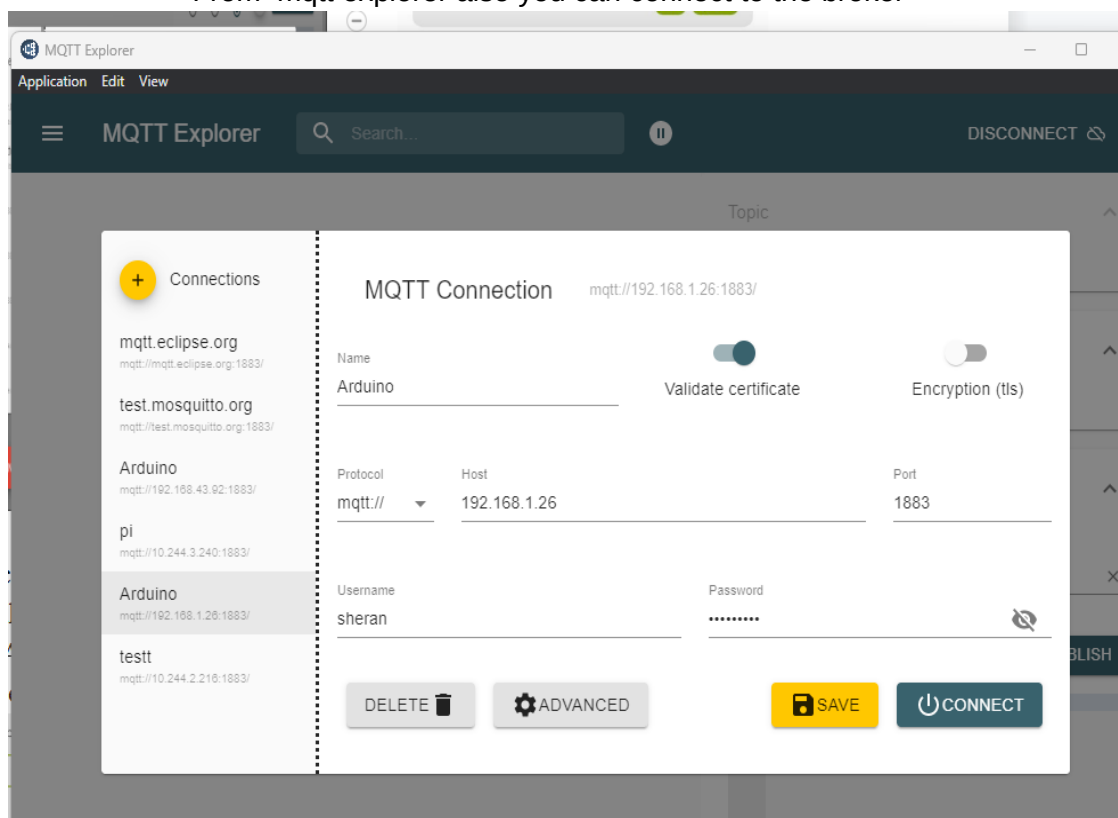
```
C:\Program Files\mosquitto>mosquitto_pub -d -t "led" -m "1" -u sheran -P sheran321
Client null sending CONNECT
Client null received CONNACK (0)
Client null sending PUBLISH (d0, q0, r0, m1, 'led', ... (1 bytes))
Client null sending DISCONNECT

C:\Program Files\mosquitto>mosquitto_sub -d -t "ldr" -u sheran -P sheran321
Client null sending CONNECT
Client null received CONNACK (0)
Client null sending SUBSCRIBE (Mid: 1, Topic: ldr, QoS: 0, Options: 0x00)
Client null received SUBACK
Subscribed (mid: 1): 0
Client null received PUBLISH (d0, q0, r0, m0, 'ldr', ... (3 bytes))
217
Client null received PUBLISH (d0, q0, r0, m0, 'ldr', ... (3 bytes))
579
Client null received PUBLISH (d0, q0, r0, m0, 'ldr', ... (3 bytes))
```

Mobile client to connect with broker.

< Edit broker

Name
mqtt

Id of client:
CL_ID_1

Protocol
TCP

URL
192.168.1.26

Port
1883

Authorization

Connect automatically

Done

Steps to connect esp32 as client

- Open arduino ide and write code for the esp32. We need to install ESP32 dev module, mqtt pub-sub client library, choose the port number correctly.
- Provide the proper clientid , username and password to establish the connection inside the code.

You can see the connection details in the serial monitor.

NOTE :- incase authentication error rc=5 occurring do this steps.

For using 1883 port number go to windows defender firewall >advance setting > inbounded > new rules. Make enable the port number 1883.

mqtt Properties

General | Programs and Services | Remote Computers
Protocols and Ports | Scope | Advanced | Local Principals | Remote Users

Protocols and ports

Protocol type: TCP

Protocol number: 6

Local port: Specific Ports

1883

Example: 80, 443, 5000-5010

Remote port: All Ports

Example: 80, 443, 5000-5010

Internet Control Message Protocol (ICMP) settings: Customize...

OK | Cancel | Apply