EE2016_MUP_LAB_EXPERIMENT_05_M2M_COMMUNICATION
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OBJECTIVES:

This experiment deals with the M2M communications (under IoT Scenario) in AVR processors.

1. Demonstrate M2M communication of two AVR-IoT boards through MQTT protocol using Mosquitto broker (server)

2. AVR-IoT board A publishes and AVR-IoT board B subscribes. 3. Board B connected to a LCD module and displays (a) message sent by Board A and (b) light sensor data published (sent) by Board A

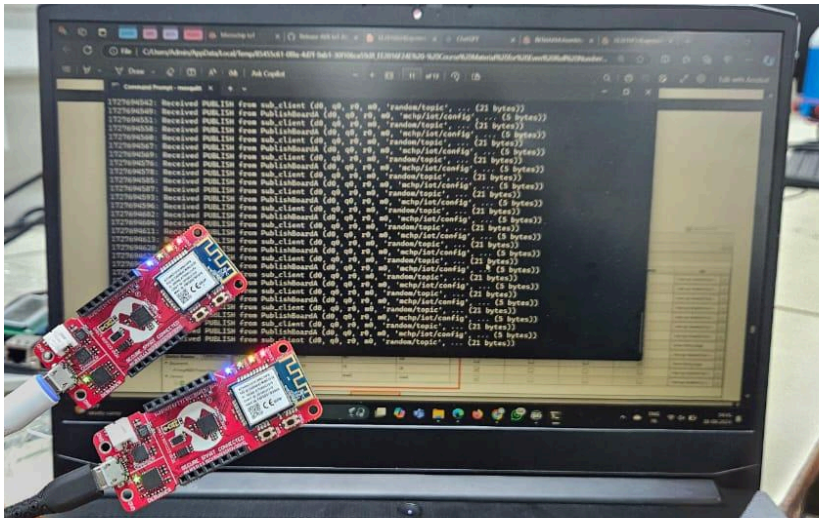
PROBLEM_1:

The code given by sir was used for this part of experiment

PROCEDURE:

- In MPLAB x IDE, a new project was initiated and set as the main project.
- MCC library was installed, and added to the IDE.
- Then the changes specified in the manual were made in the IDE in the following sections i.e, MQTT, WINC, PIN Module, and Clk frequency.
- After generating the changes, the code for Publisher was put under the sections main.c and mqtt_example.c.
- Then the avr board is connected to the cpu and the program is built and flashed into the avr iot board.
- Parallelly Mosquitto broker was kept running in the pc which was connected to the mobile hotspot (the user name and password is specified in the winc section along with the ip address.)
- After the flash has been successful the avr board gets connected to the mosquitto broker(i.e., the publish board continuously send the msg after 10 secs)
- Then the code is replaced with the subscriber code and another avr iot board is connected and the program is burnt.
- After this the subscriber also gets connected to the mosquitto.

RESULT :

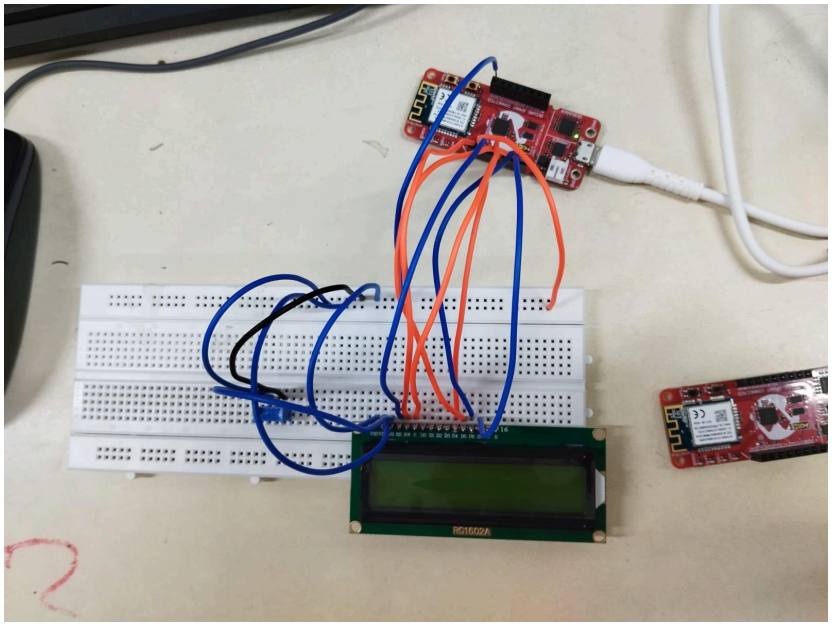


PROBLEM_2:

The code given by sir was used after filling the gaps.

PROCEDURE:

- In MPLAB x IDE, a new project was initiated and set as the main project.
- MCC library was installed, and added to the IDE.
- Then the changes specified in the manual were made in the IDE in the following sections i.e, MQTT, WINC, PIN Module, and Clk frequency.
- After generating the changes, the code for Publisher (after filling the gaps) was put under the sections main.c and mqtt_example.c.
- Then the avr board is connected to the cpu and the program is built and flashed into the avr iot board.
- Parallelly Mosquitto broker was kept running in the pc which was connected to the mobile hotspot (the user name and password is specified in the winc section along with the ip address.)
- After the flash has been successful the avr board gets connected to the mosquitto broker(i.e., the publish board continuously send the msg after 10 secs)
- Then the code is replaced with the subscriber code and another avr iot board is connected and the program is burnt.
- The connections were made between the lcd and the subscriber board according the manual given in moodle.



- After this the subscriber also gets connected to the mosquitto.
- The message is then displayed on the lcd display.

RESULT:

The same procedure is repeated for the light sensor display problem.

OFFLINE EXPERIMENT:

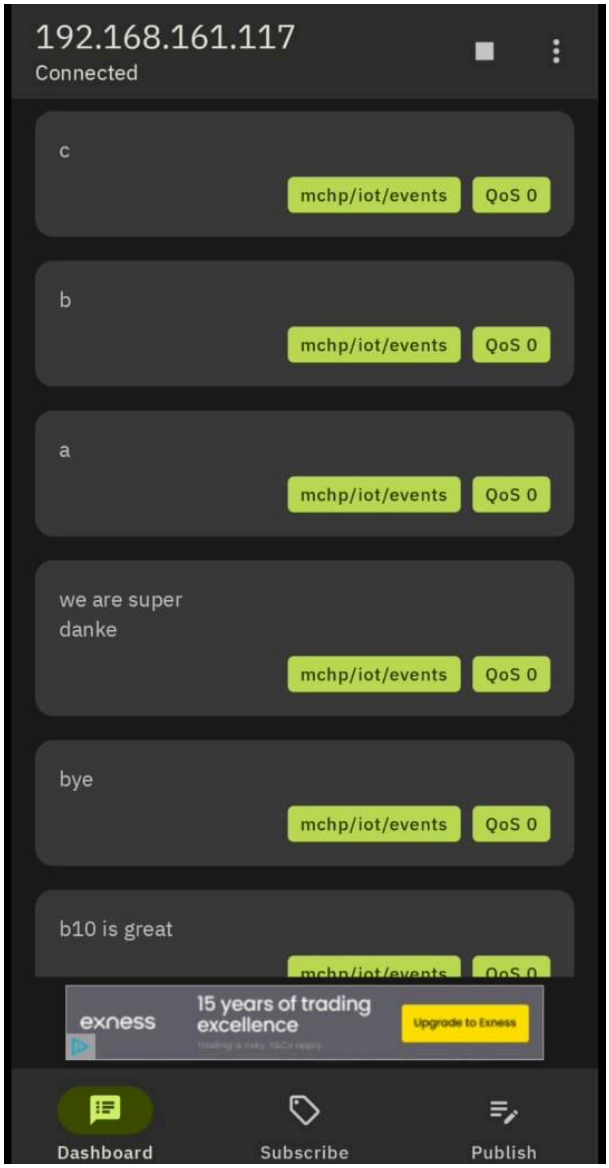
AIM: To run Mosquitto Broker in your laptop and connect two mobiles to that broker and transmit data (in the form of text) from one device to another.

PROCEDURE:

1. We began by downloading and installing the MyMQTT app on two separate mobile devices from the respective app stores.
2. Following the steps outlined in the lab manual, we set up the Mosquitto Broker on our laptop. This involved installing the Mosquitto software and configuring it for local network use.

3. To ensure proper communication, we connected both mobile devices and the laptop to the same Wi-Fi network. We opted for a personal mobile hotspot rather than the IITM Wi-Fi for better connectivity and control over the network.
4. After the network was set up, we launched the Mosquitto Broker on the laptop as instructed in the lab manual. The broker was now ready to facilitate message passing between the mobile devices.
5. To configure the MyMQTT apps, we first identified the broker address, which is the IPv4 address of the laptop. We retrieved this by running the `ipconfig` command in the command prompt (Windows), which displayed the necessary IP information.
6. On both mobile devices, we launched the MyMQTT app and entered the laptop's IPv4 address in the Host field. We kept the other settings at their default values to maintain simplicity.
7. On the first mobile device, we used the app to publish a message to the topic "test/topic." For this test, we set the message content to "Hello."
8. On the second mobile device, we subscribed to the same topic, "test/topic." This ensured that any messages published by the first mobile would be received by the second mobile.
9. After completing the setup, we successfully verified that the message "Hello" sent by the first mobile was received by the second mobile, demonstrating effective communication via the Mosquitto broker.

RESULT :



MY CONTRIBUTION:

- I was responsible for the problem-2 and problem-3 coding and wiring.